DV717SI&DV721SI

service manual

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Chapter One About Maintenance

1.1 Safety precautions

1.1.1 Power supply

When maintenance personnel are repairing DVD players, he should pay special attention to the power board with 220V AC and 330V DC which will cause hurt and damage to persons!

1.1.2 Precautions for antistatic

Movement and friction will both bring static electricity which causes serious damages to integrated IC. Though static charge is little, when a limited quantity of electric charge is added to large-scaleintegrated IC, as the capacitance is very small in the meantime, now the integrated IC is very much easy to be struck through by static electricity or the performance will decrease. Thus static electricity prevention is of extraordinary importance. The following are several measures to prevent static electricity:

1. Use a piece of electric conduction metal with the length of about 2 metres to insert into the earth, and Fetch the lead wire from the top of the surplus metal and connect to the required static electricity device. The length and depth of the metal embedded under the earth should be determined according to the wettability of the local soil. For humid places, it may be shorter, and longer and deeper for dry places. If possible, it can be distributed and layed in terms of "#" shape.

2. On operating table-board, the antistatic table cushion should be covered and grounded.

3. All devices and equipments should be placed on the antistatic table cushion and grounded.

4. Maintenance personnel should wear antistatic wrist ring which should be grounded.

5. Places around the operating position should also be covered with electric conduction cushion or Painted with antistatic paint.

1.1.3 Precautions for laser head

1. Do not stare at laser head directly, for laser emission will occur when laser head is working, which will Hurt your eyes!

2. Do not use wiping water or alcohol to clean laser head, and you may use cotton swab.

1.1.4 About placement position

1. Never place DVD player in positions with high temperature and humidity.
2. Avoid placing near high magnetic fields, such as loudspeaker or magnet.
3. Positions for placement should be stable and secure.

1.2 Maintenance method

1.2.1 Visualized method

Directly view whether abnormalities of collision, lack of element, joint welding, shedding welding, rosin joint, copper foil turning up, lead wire disconnection and elements burning up among pins of elements appear. Check power supply of the machine and then use hands to touch the casing of part of elements and check whether they are hot to judge the trouble spot. You should pay more attention when using this method to check in high voltage parts.

1.2.2 Electric resistance method

Set the multimeter in resistance position and test whether the numerical value of resistance of each point in the circuit has difference from the normal value to judge the trouble spot. But in the circuit the tested numerical value of resistance is not accurate, and the tested numerical value of integrated IC's pins can only be used for reference, so the elements should be broken down for test.

1.2.3 Voltage method

Voltage method is relatively convenient, quick and accurate. Set the multimeter in voltage position and test power supply voltage of the player and voltage of a certain point to judge the trouble spot according to the tested voltage variation.

1.2.4 Current method

Set the multimeter in current position and test current of the player of a certain point to judge the trouble spot. But when testing in current method, the multimeter should be series connected in the circuit, which makes this method too trivial and troublesome, so it is less frequently used in reality.

1.2.5 Cutting method

Cutting method should be combined with electric resistance method and voltage method to use. This method is mainly used in phenomena of short circuit and current leakage of the circuit. When cutting the input terminal voltage of a certain level, if voltage of the player rises again, it means that the trouble lies in this level.

1.2.6 Element substitution method

When some elements cannot be judged good or bad, substitution method may de adopted directly.

1.2.7 Comparison method

A same good PC board is usually used to test the correct voltage and waveform. Compared these data with those tested through fault PC board, the cause of troubles may be found.

Through the above maintenance method, theoretical knowledge and maintenance experience, all difficulties and troubles will be readily solved.

1.3 Required device for maintenance

- ◆ Digital oscillograph (≥100MHE)
- ◆ TV set
- ◆ SMD rework station
- ◆ Multimeter
- ◆ Soldering iron
- ◆ Pointed-month pincers
- ◆ Cutting nippers
- ◆ Forceps
- ◆ Electric screw driver
- ◆ Terminals connecting cord
- ◆ Headphone
- ◆ Microphone

Chapter Two

Functions and Operation Instructions

2.1 Features

This player has employed the new generation DV decode chip with built-in Dolby Digital decoder which willbring you to a brand-new AV entertainment world. The 2-laser super error-correction mechanism supports CD-R.

Brand-new AV Effects

1.Compatible with DivX, MPEG4 discs to produce wonderful pictures.

2.108MHz/12bit video DAC, with more vivid and brilliant pictures.

3.Progressive-scan video outputs to eliminate the flickers hardly ouvercome by interlacing scan and therefore your eyesight will be well-protected. At the same time, the pictures deflnltion Is sharply enhanced and the pictures will be finer, smoother and stabler

4.Brightness, chroma and contrast adjustment functions to render your eyes more comfortable.

5.Digital echo Karaoke to enable your singing easier.

6.Composite Video, S-Video and Component Video outputs.

7.Bullt-In Dolby Digital decoder, separate 5.1Ch Outputs.

8.Dolby output for 2channel(DOWNMIX).

9.DVD-Audio decoding output to reproduce original and realistic sound effects.

High Quality Digital Audio

1.Optical and coaxial outputs for Digital audio.

2.DTS, Dolby Digital, PCM Digital audio outputs to satisfy the Fans'Ss acoustic requirements.

Many Convenient Features

1.Screen saver protects your TV set carefully.

2.The novel Mp3 playback window GUI provides you a new way to appreciate Mp3 music.

3.Multi-angle playback function makes it possible for you to view a scene from different camera angles.

4.It's possible to select the desired beginning, development and ending of a story.

5.Direct entry into desired scenes(title/chapter/track search).

6.Zooming function to zoom up any playing picture.

7.Capable of playing PAL/NTSC discs.

8.Multiple aspect ratios to fit TV sets of various screen ratios.

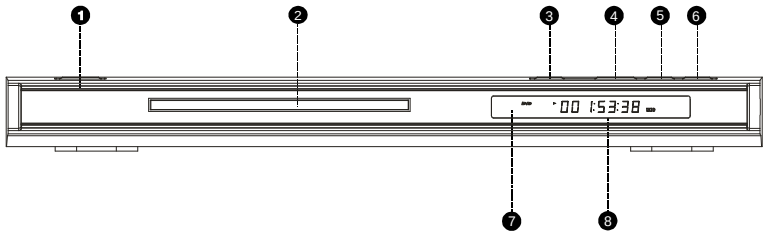
9.Parental lock function to prevent children from watching unsuitable discs.

10.Multiple dubbing languages and subtitle languages bring you the best entertainment status all the time.

Super Compatibility with super VCD, VCD, CD , CD-R , MP3,HDCD,KODAK PICTURE CD etc.

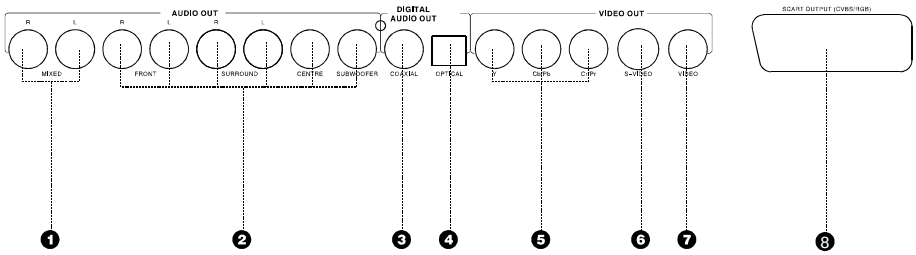
2.2 Control Button Locations and Explanations

2.2.1 **Front Panel Illustration**



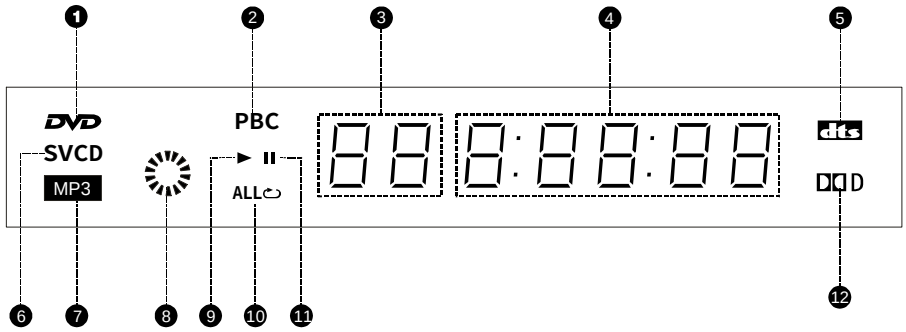
❶ POWER switch
❷ Disc tray
❸ OPEN/CLOSE button
❹ PLAY button
❺ PAUSE button
❻ STOP button
❼ IR SENSOR
❽ Display windows

2.2.2 Rear Panel Illustration



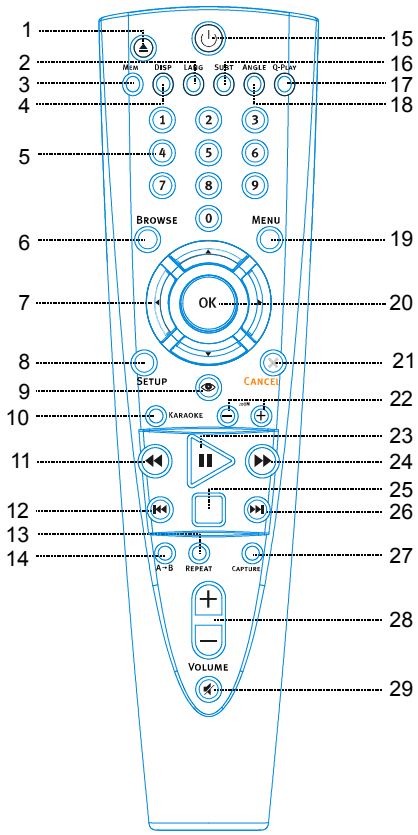
❶ Mixed Audio Out jack
❷ 5.1CH Audio Out jacks
❸ Digital Audio Coaxial Out jack
❹ Digital Audio Optical Out jack
❺ Video Component/Y Pb Pr Out jacks
❻ S-Video
❼ Video Out jack
❽ SCART Outjack

2.2.3 VFD Display Window Illustration



❶ DVD disc
❷ PBC
❸ Chapter or Track
❹ Playback time
❺ DTS
❻ VCD、CD、SVCD Disc
❼ MP3 Disc
❽ Playback status indication
❾ PLAY
❿ Repeat
⓫ PAUSE
⓬ DOLBY Digital

2.2.4 Remote Control Illustration



Display DVD menu or open/close PBC.

⓴ OK Button

㉑ Cancel Button

㉒ ZOOM +/-Button

Zoom in/out the displayed frame.

㉓ [▷]Button

Play or pause playback.

㉔ [⏭]Button

Fast forward play.

㉕ [□]Button

Stop playback.

㉖ [⏭]Button

Skip forward.

㉗ CAPTURE Button

Set the played image as the power-on logo.

㉘ VOL +/- Button

Increase/decrease volume level.

㉙ MUTE Button

Press once to mute, twice to turn off.

❶ [⏏]Button

Open or close the disc tray.

❷ LANG Button

Change the audio language or audio channel

❸ MEMORY Button

Save the playing point or jump to the saved point

❹ DISP Button

Display or hide disc information.

❺ NUMBER Buttons

❻ BROWSE Buttons

switch new user interface.

❼ CURSOR Buttons

❽ SETUP Button

Function Setup.

❾ [👁]Button

Open/close the virtual keyboard function.

❿ KARAOKE Button

Karaoke operation menu.

⓫ [⏮]Button

Fast backward play.

⓬ [⏮]Button

Skip backward.

⓭ PEPEAT Button

Repeat play.

⓮ A-B Button

Repeat the select.

⓯ [⏻]Button

Press once to stand by, Press twice to play.

⓰ SUBT Button

Change subtitle language, Switch JPEG display mode.

⓱ Q-PLAY Button

Skip the advertisement/warning and play the DVD directly.

⓲ ANGLE Button

Change camera angle .

⓳ MENU Button

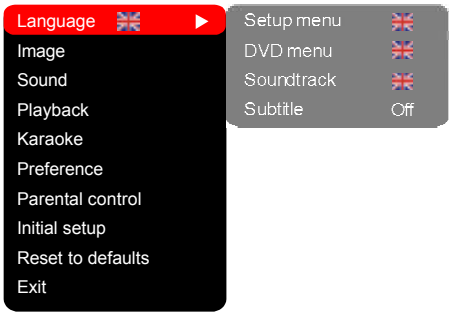
2.3 Accessories

AUDIO/VIDEO CORD 1PCS
REMOTE 1PCS
AAA SITE BUTTERIES 2PCS
WARRANTY CARD 1PCS
USER MANUAL 1PCS
KARAOKE DISC 1PCS

2.4 FUNCTION SETUP

2.4.1 Function Setup

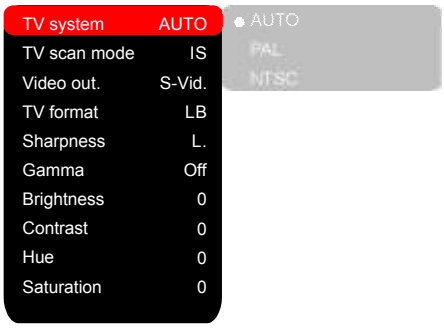
1.Press the [SETUP] button and the screen displays the selection menu of function setup.



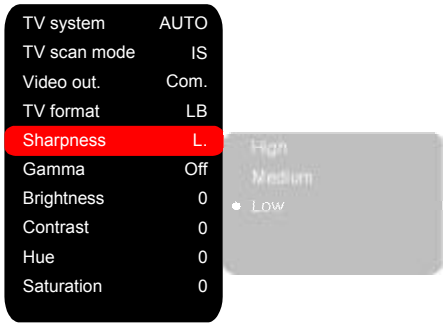
2.Press the [CURSOR] button to select the menu to be entered and press the [OK] or button to confirm. Or press the [CURSOR] button to Exit item and then press the [OK] button to exit

3.Press [UP/DOWN] arrow to select the desired item you want to set and press [OK].

For example, press [UP/DOWN] arrows to select IMAGE and press [OK]. The Image setting page appears on the screen.



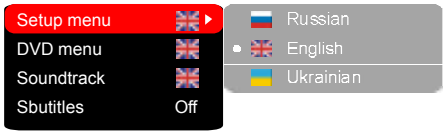
4.Press [UP/DOWN] arrow to select the SHARPNESS item. Press [OK] to confirm it. And then press [UP/DOWN] arrow to select the desired valus.For example: Press[UP/DOWN] arrow to select “Medium” ,then press [OK], the TV screen display.



5.Press [LEFT] button if you want to return to the previous setup page.

6.Press [SETUP]to exit the setup menu.

2.4.2 Language



1.Setup menu: This item is used to set the prompts language on the screen.

◆Optional setting: Russian, English, Ukrainian.

◆Default: English.

2.DVD menu: To set the preference disc menu lang when playing.

◆Optional setting: Russian, English, Estonian, Latvian, Kazakh, Romanian, Byelorussian, Ukrainian, Chinese, Others.

◆Default: English.

3.Sountrack:To set the preference audio language when playing.

◆Optional setting: Russian, English, Estonian, Latvian, Kazakh, Romanian, Byelorussian, Ukrainian, Chinese, Others.

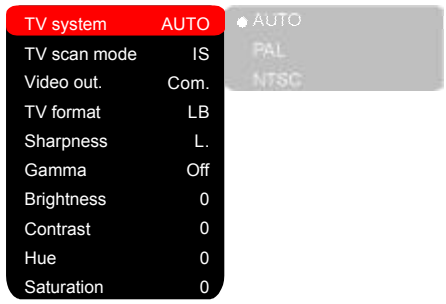
◆Default: English.

4.Subtitles: To set the preference subtitle language when playing.

◆Optional setting: Off, Russian, English, Estonian,Latvian, Kazakh, Romanian, Byelorussian, Ukrainian, Chinese, Others.

◆Default: Off

2.4.3 Image.

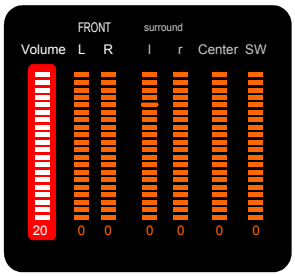


1.TV system: This item is used to the video output system of this unit.
◆Optional setting: Auto, PAL, NTSC.
◆Default: AUTO.
2.TV scan mode: To set Progressive scan, Interlaced scan mode.
◆Optional settings: Progressive , Interlaced .
◆Default: Interlaced .
3.Video output: To set the types of SCART out connector.
◆Optional setting: S-Video,Component , SCART,
◆Default: Component
◆When using RGB outputs from the SCART interface,please select RGB. Other wise , please select Com-ponent,and when using S-Video output please select S-Video.
4.TVn format: To set the aspect ratio of this player's output image.
◆Optional setting: 4:3 Pan-scan, 16:9 letterb., 16:9 TV.
◆Default: 16:9 letterb.
5.Sharpness:Used to set the sharpness of video outputs.
◆Optional setting: High, Medium, Low.
◆Default: Medium.
6.Gamma emendation:This item is used to setup the Gamma value of video output.
◆Optional setting: High, Medium, Low, Off.
◆Default: Off.
7.Brightness:Used to set the brightness of video outputs.
8.Contrast:Used to set the contrast of video outputs.
9.Hue: Used to set the hue of video outputs.
10. Saturation: Used to set the saturation of video outputs.
◆Brightness, contrast, hue and saturation adjusting means:
A. Press [UP/DOWN] arrow in the video setup menu to select the desired item you want to adjust. Press [OK] or [RIGHT] button to enter the item's adju-stment.
B. Press [UP/DOWN] arrow to adjust the setting value.

2.4.4 Sound

1.Mixer...

A.Configuration: To set this player's DOWNMIX mode to change multi-channel audio into two channel audio.
◆Optional setting: Stereo, 5.1
◆Default: Stereo.
B.Stereo mix: To set the output means of the left or right audio when playing a Dolby disc with separate two-channel audio.
◆Optional setting: L+R, L, R.
◆Default: L+R.
C.Surr. Mix: To set output means of the surround left and right audio when playing a stereo disc.
◆Optional setting: Off, sum, Virt.Surr.
◆Default: Off.
D. Low band: select the channel that you desire to output low frequency signal.
◆Optional setting: Front F, Center C, Surround Sr, Subwoofer SW.
◆Default: Front F, Subwoofer SW.
E. Channels: To set volume of each individual channel.
a. Press [UP/DOWN] navigation keys to select CHANNEL TRIM, then press the [OK] or [RIGHT] navigation key to select ENTER SETUP PAGE as shown in the TV screen:



b. Press [LEFT/RIGHT] navigation keys to select the desired channel to adjust.
c. Press [UP/DOWN] navigation keys to raise or lower volume of the channel.
d. Press [OK] or [LEFT] to return to the Mix.. setup page.
F. Delays: To set delay time of the Center/ Surround/Subwoofer Speaker.

a. Press [UP/DOWN] navigation keys to select Delays in Channels item, then press [OK] or [RIGHT] navigation key select ENTER SETUP PAGE as shown in the TV screen.

b.Press [UP/DOWN] navigation keys to Select the desired item oup Press [OK] or [RIGHT] button to enter setting.

C.Press [UP/DOWN] navigation keys to raise or lower volume.

d.Press [OK] or [LEFT] to return to the Delays in channels setting page.

G.PRO Logic II: To set PRO Logic II to ON or OFF. If the TITLE does not support this function, we recommend that you set this item to AUTO because it would become worse if the processing effects were added forcibly.

◆Optional setting: Auto, On, Off .

◆Default: Auto.

2.Digital output: select to set the format and stream form of digital audio output.

A.SPDIF format:

◆Optional setting: RAW format, SPDIF/PCM.

◆Default: RAW format.

B.LPCM

◆Optional setting: 48 kHz 16 bit, 96 kHz 24 bit, 192kHz24bit.

◆Default: 48 kHz 16 bit.

3.Tuning:

A.Max volume: set the maximum volume limit.

B.Equalizer: To set Equalizer modes.

◆Optional setting: Off, Rock, Pop, Live, Dance, Techno, Classic, Soft.

◆Default: Off.

C.Echo: To set different sound field effects.

◆Optional setting: Off, Concert, Living room, Hall,Bathroom, Cave, Arena, Church.

◆Default: Off.

D.Tone balance: to set the tone level to match your diapason when you're singing

a.Press [UP/ DOWN] cursor buttons to select "tone"item in Audio Setting page, and then press [OK] or [RIGHT] button to enter Adjustment Menu.

◆Method to adjust tone control:

B.Press [UP/DOWN] cursor button to adjust setting value.

c. Press [OK] or [LEFT] button to return to Audio Setting page after adjustments are done.

2.4.5 Playback

1.DVD: set whether information ofadvertisement and warnings at the beginning of DVD disc is skipped to play the movie directly.

Always skip ads

◆Optional setting: Yes, NO

◆Default: Number

2.VCD/SVCD: To set the PCB status.

◆When playing Super VCD or VCD2.0 discs, if thePCB is ON, the menu image displays.

◆Optional setting: On, Off.

◆Default: On.

3.Files:data disc may probably includes Mp3, JPEG and MPG format files in which you may select DVD player to read the file type.

◆Optional setting: Audio, Picture, Video.

◆Default: Audio, Picture, Video.

4. Repeat : select the repeat playback mode.

◆Optional setting: Off, Single, all.

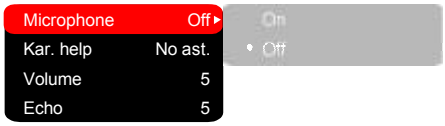
◆Default: Off.

5. Load effect: set the may to play JPEG image.

◆Optional setting: Off, from top, from bottom.

◆Default: Off.

2.4.6 Karaoke



1.Microphone: switch on or off microphone.

◆Optional setting: On, Off

◆Default: Off.

2.Kar. help: select accompany singing means.

◆Optional setting: Channels L, Channels R, Channels No ast, Channels No voc.

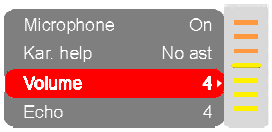
◆Default: Channels No ast.

3. Volume:

A.In microphone setup page, press [UP/DOWN] cursor to select “Volume” item, and then press [OK] button to enter the adjustment menu.

B.Press [UP/DOWN] cursor to adjust the setup value.

C.After adjustment finishes, press [OK] button to return to microphone setup page.

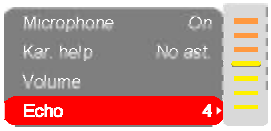


4.Echo:

A.In microphone setup page,press [UP/DOWN] cursor to select “Echo” item, and then press [OK] button to enter the adjustment menu.

B.Press [UP/DOWN] cursor to adjust the setup value.

C.After the adjustment finishes, press [OK] button to return to microphone setup page.



2.4.7 Preference

1.LED Control:This item is used set color of led on the front panel.

◆Optional setting: On, Off.

◆Default: On.

2.Gr. equalizer: This item is used to set wether the Dynamic Spectrum is allowed.

◆Optional setting: On, Off.

◆Default: Off.

◆Dynamic Spectrum display is invalid in Data disc、DVD AUDIO playback.

3.Background: This item is used ti setup the sort of Power-in Logo.

◆Optional setting: Standard, saved.

◆Default: Standard.

NOTE

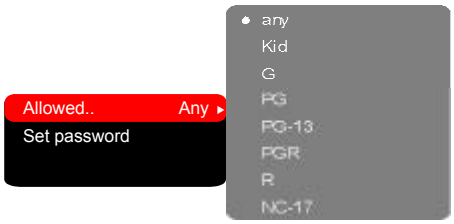
The Screen Logo refers that use the image selected by pressing the [CAPTURE] button as the power-on logo. When in the operation of changing screen, if the power-on logo has not set in Screen Logo, the unit will automatically set the power-on logo as Screen Logo.

4.Screen saver: Open or close the screen saver function.

◆Optional setting: On, Off.

◆Default: On.

2.4.8 Parental control



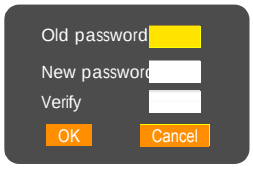
1.Allowed..: To set the parental control ratings to prevent children from watching the restricted contents.(In case the discsupports this function.)

◆Optional setting: any, Kid, G, PG, PG-13, PGR, R ,NC-17.

◆Default: any.

2.Set password: To set four digit password to enable you to change the parental control ratings.

◆Default: 7890



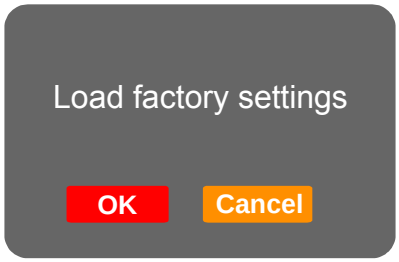
2.4.9 Initial setup

Press [UP/DOWN] arrow to select the desired option and Press [OK] button to confirm it.

NOTE

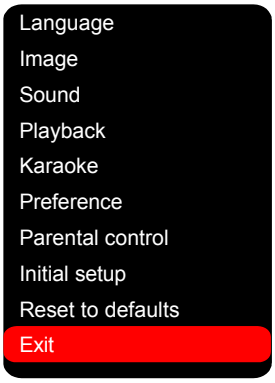
In this setup state, you may not press [LEFT] button to return to the previous menu.

2.4.10 Rest to defaults



Reset to defaults: To restore all settings to the default value except for the parental control and password settings.

2.4.11 Exit



Press [UP/DOWN] arrow to select the Exit item. Press [OK] button to exit the setup menu.

2.5 Specifications

Playable discs	DVD-Video,Super VCD,VCD,DivX 3.11,dIVx 4,DivX 5,DivX Pro,XviD,DVD-Audio, CD-DA, CD+DG, HDCD, MP3,WMA,Kodak Picture CD,JPEG	
Inputs	MIC input	
Outputs	Audio outputs	Analog audio output: Stereo,output 5.1CH Digital audio output: Coaxial,Optical
	Video outputs	Composite,S-Video,component Y Cb Cr,progressive scan output Y Pb Pr,RGB/SCART
	Headphones output	
Vidio characteristics	Video amplitude: S-Video amplitude: Component video amplitude:	1.0Vp-p(75Ω) Y:1.0Vp-p(75Ω) C:0.286Vp-p(75Ω) 1.0Vp-p(75Ω) Cb/Cr:0.7Vp-p(75Ω)
Audio characteristics	Frequency response Signal-to-noise ratio THD	20-20000Hz(±dB) >100(dB) <0.01%
Operating voltage	~110-250V,50/60Hz	
Power consumption	14W	
General specification	Dimensions: Mass:	380×258×41.5 mm 2 kg
Operating temperature	5-35℃	
Operating humidity	15-75(no condensation)	

◆Design and specifications are subject to change without notice.
◆We do not guarantee that all discs can be played smoothly due to the disc quality ,disc recording quality and recording format.

Chapter Three Principle and Servicing

Section One Principle of the Player

3.1.1 Block diagram of the player

DV717SI is composed of decode circuit, servo circuit, audio circuit, video circuit, MIC circuit and power circuit. Block diagram is shown as in the following figure 3.1.1.1:

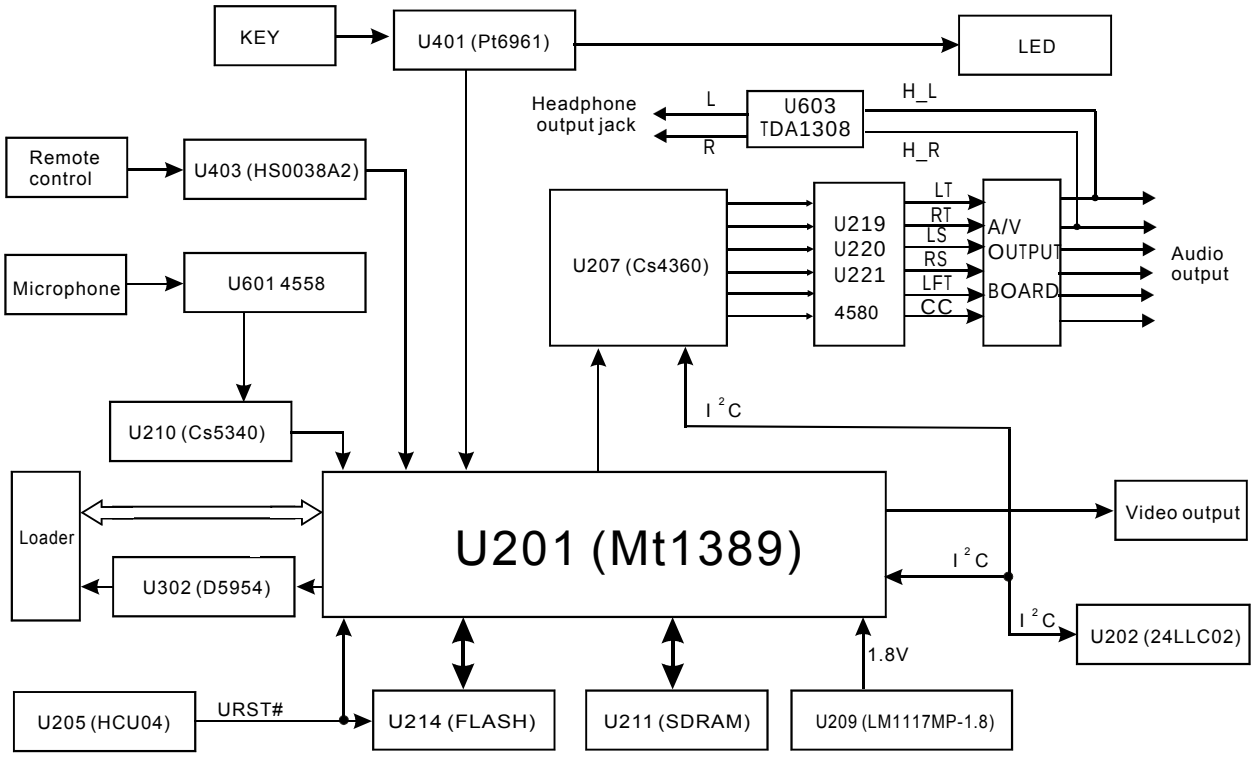


Figure 3.1.1.1 Block diagram of the player

3.1.2 PCB board block diagram of the player

PCB board block diagram of the player is shown in the following figure 3.1.2.1:

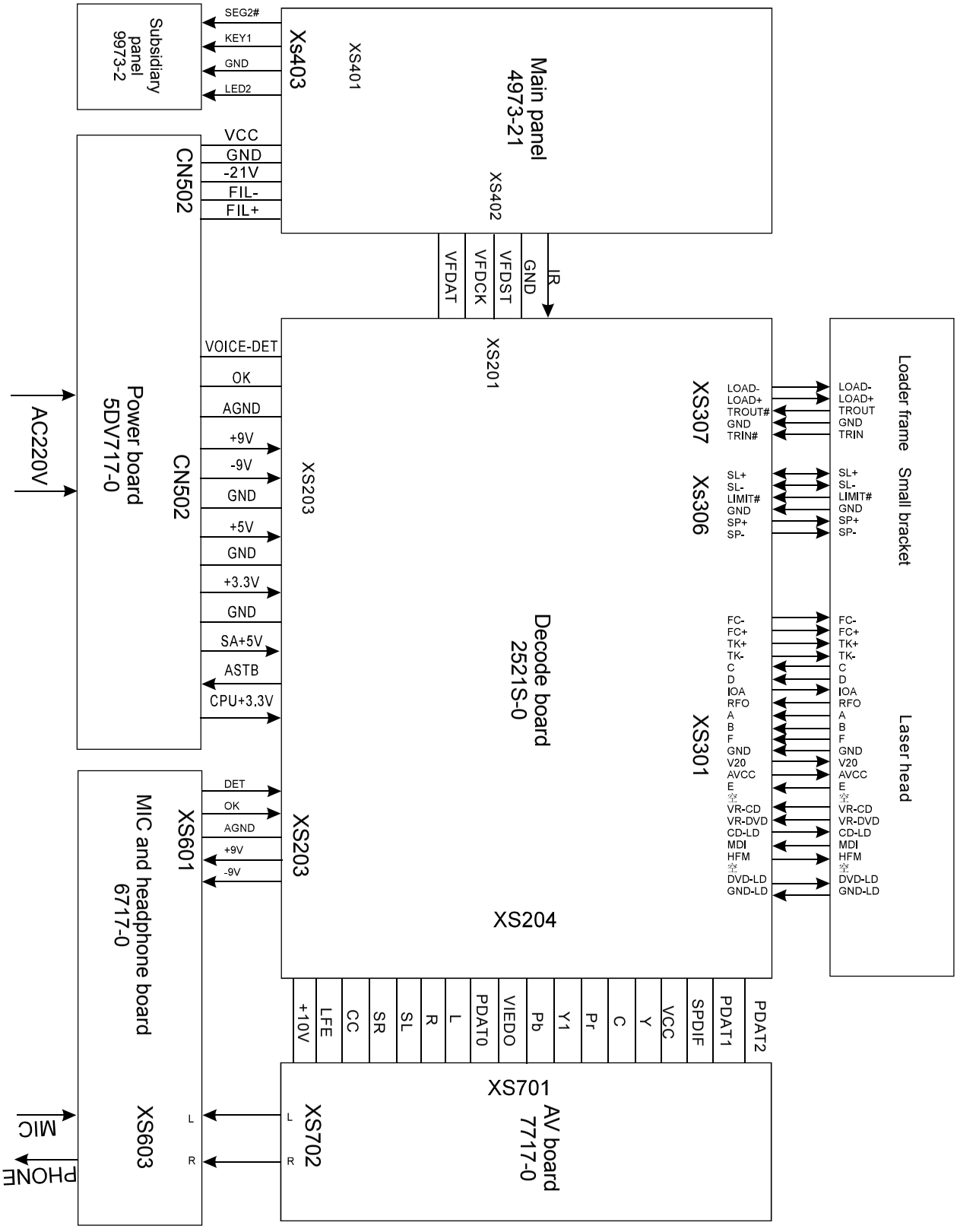


Figure 3.1.2.1 PCB board block diagram of the player

3.1.3 Introduction to IC of the player

Introduction to IC of the player is shown as in the following table:

Semi-finished PCB name	IC model name	Location	Function
Power board 5DV717-0	AZ431	U503	Precise voltage regulator
	HS817	U502	Photoelectric coupler
	FSDH321	U501	Power switch IC
Main panel 4973-2	PT6312	U401	Control panel IC
	HS0038B3V	U402	Remote control receiver
OK board 6717-0	KA4558	U601	Operational amplifier (MIC amplifying)
	TDA1308	U603	Headphone amplifying
Decode board 2521S-0	NJM4558	U219,U220,U221	Operational amplifier (audio amplifying)
	HCU04	U205	Phase inverter
	HY57V641620HGT-7	U211	SDRAM
	LM1117	U209	1.8V voltage regulator IC
	24C02	U202	EEPROM
	MT1389 C version	U201	Decode chip
	D5954	U302	Servo drive
	CS4360	U207	D/A inverter
	CS5340	U210	A/D inverter
	29LV160BE	U214	FLASH

Section Two Unit Circuit Principle

3.2.1 Laser head pin introduction

Laser head pin introduction is shown in the following table:

Pin	Name	Signal flow direction	DVD disc	CD disc	No disc	Function description
1	F-	Input loader	2.52	2.34	0.46	Focus error signal is added to two sides of pick-up focus coil
2	F+	Input loader	2.49	2.49	0.93	
3	T+	Input loader	2.53	2.51	0.94	Trace error signal is added to two sides of pick-up trace coil
4	T-	Input loader	2.58	2.51	0.93	
5	C	Input MT1389	2.2	2.25	2.04	Disc data signal
6	D	Input MT1389	2.2	3.2	2.04	Disc data signal
7	IOA	Input MT1389	0.01	3.2	3.21	Disc identification signal, CD is 3.3V, DVD is 0V
8	RF	Input MT1389	2.21	2.53	1.28	The sum of disc data signal
9	A	Input MT1389	2.17	2.22	2.04	Disc data signal
10	B	Input MT1389	2.19	2.27	2.04	Disc data signal
11	F	Input MT1389	2.07	2.44	2.03	Supplementary signal used in trace
12	GND	Ground	0.01	0.01	0	Grounding
13	V20	Input loader	2.04	2.06	2.03	Reference voltage
14	Vcc	Input loader	5.04	5.04	5.02	Supply voltage for loader
15	E	Input MT1389	2.06	2.45	2.03	Disc data signal
16	Blanking	haning in air	0.01	0	0	unused
17	VR-CD	Input loader	0.21	0.01	0	Through the handling inside loader, make sure MD11 is 180mV when reading CD
18	VR-DVD	Input loader	0.01	0.2	0	Through the handling inside loader, make sure MD11 is 180mV when reading DVD

19	LD-CD	Input loader	0.09	2.1	0	CD laser power control signal
20	MDII	Input MT1389	0.21	0.2	0	CD and DVD laser power monitoring signal
21	HFM	Input loader	5.04	5.04	5.02	High frequency overlapping signal produces laser with different wave length inside loader
22	Blanking	unused	0.01	0.1	0	
23	LD-DVD	Input loader	2.21	0.1	0	DVD laser power control signal
24	GND	unused	0.01	0.01	0	Grounding

Note: 1. When reading DVD, there are only A, B, C, D signals.

2. When reading CD, there are A, B, C, D, E, F signals.

3. RFO=A+B+C+D.

4. Focus error signal=(A+C)-(B+D) Trace error signal=E-F.

3.2.2 Disc identification circuit

1. The circuit schematic diagram is shown as the following figure 3.2.2.1:

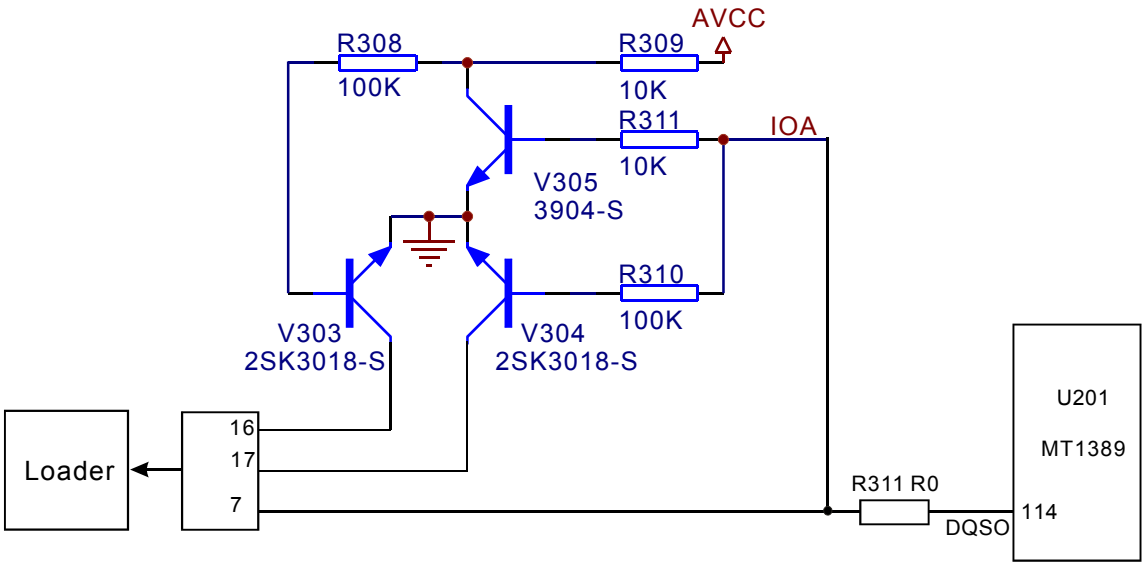


Figure 3.2.2.1 Disc identification circuit

2. Working principle: when reading CD disc, the loader outputs a high level (3.3v) to IOA; when reading DVD disc, the loader outputs a low level (0V) to IOA.

When reading CD disc, IOA is high level; V304 and V305 are on; V305 collector electrode is low level;V303 drain electrode is equal to hang in the air (laser receiver pipe inside loader selects CD channel). When reading DVD disc, IOA is low level; V304 and V305 cut off; V303 is on; V304 drain electrode is equal to hang in the air (laser receiver pipe inside loader selects CD channel).

Note: V303 and V304 are MOS pipe.

3.2.3 Laser power control circuit

1. The circuit schematic diagram is shown as the following figure 3.2.3.1:

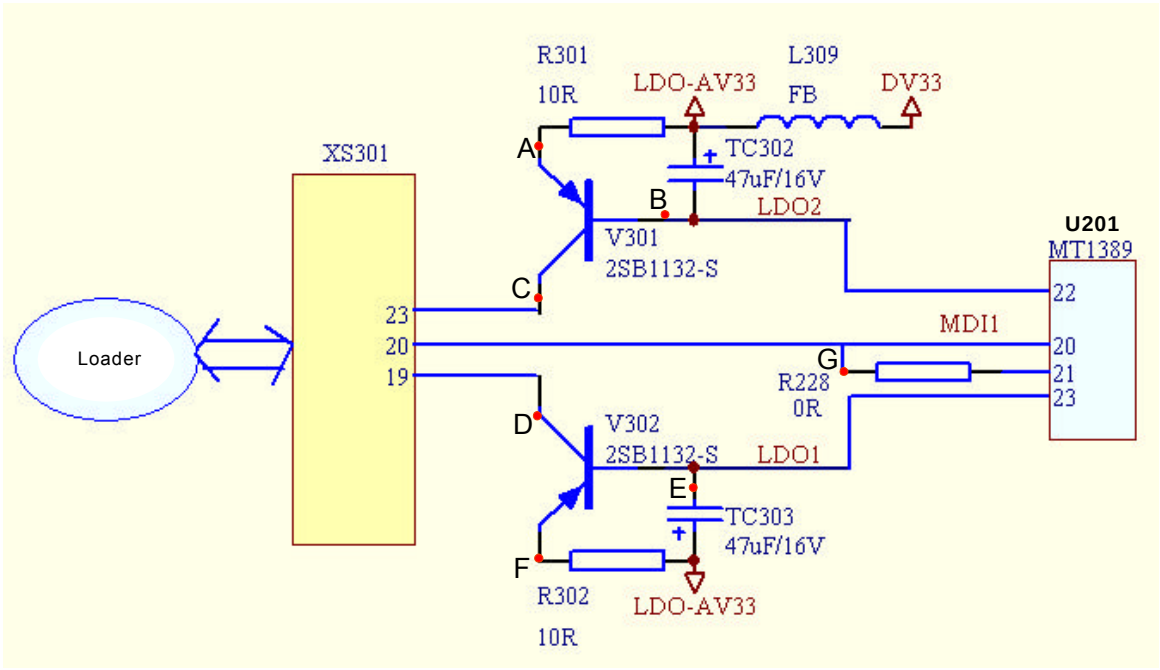


Figure 3.2.3.1 Laser power control circuit diagram

2. Working principle: Pin 20 of MT1389 is VCD laser power strong/weak signal input checking pin; pin 21 is DVD laser power strong/weak signal input checking pin; 23 pin is VCD laser power drive control output pin and pin 22 is DVD laser power drive control output pin.

When reading VCD disc, if pin 20 of U201 (MT1389) has detected that the laser output power it too strong, after being processed by U201 (MT1389) internal circuit, pin 23 output voltage increases and the on-state degree of V302 decreases to make the voltage supplied for pick-up decrease and the light emitting of laser head become weak. If pin 20 has detected that the laser output power is too low, pin 23 output voltage decreases; on-state degree of V302 increases and the light emitting of laser head become strong to reach the purpose of automatically adjusting laser output power.

When reading DVD disc, pin 21 is signal input checking pin and pin 22 is drive control output pin. The working principle is the same with that when playing VCD disc.

3. Key point voltage (unit: V), shown as the following table:

Key point	Position	Voltage when reading DVD	Voltage when reading VCD
A	Emitter electrode of V301	2.9	3.2
B	Base electrode of V301	2.2	3.2
C	Collector electrode of V301	2.2	0

D	Collector electrode of V302	0	2.2
E	Base electrode of V302	3.2	2.2
F	Emitter electrode of V302	3.2	2.9
G	one end of R228	0.2	0.2

3.2.4 Reset circuit

1. The circuit schematic diagram is shown as the following figure 3.2.4.1:

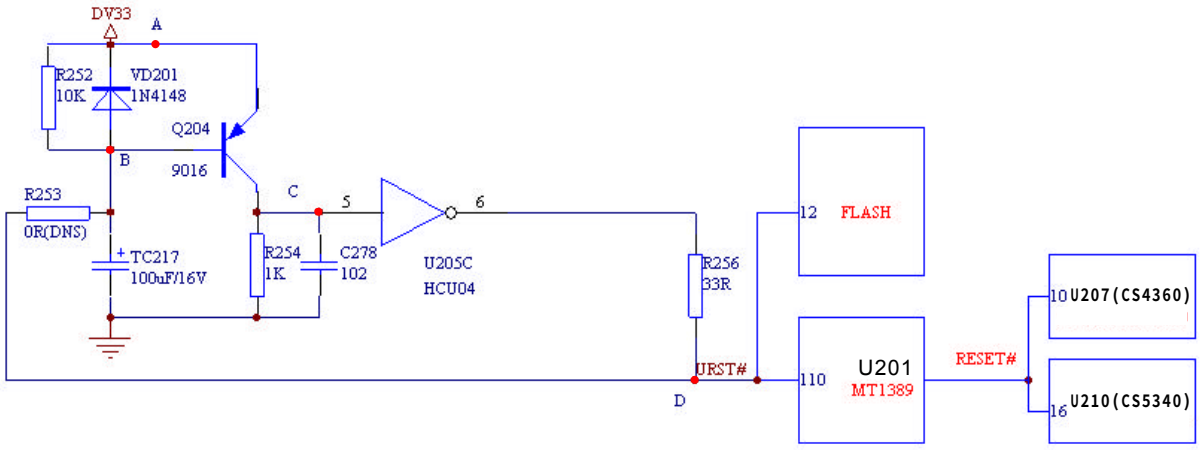


Figure 3.2.4.1 Reset circuit schematic diagram

2. Working principle: The two ends voltage of capacitor T217 cannot change suddenly, anode of the capacitor begins charging from 0V and now triode Q204 is on. Pin 5 of phase inverterU205 (HCU04) output port is high voltage and pin 6 of it is low voltage to reset chip U201 (MT1389) and chip U214 (FLASH). When charge of the capacitor is close to 3.3V, triode Q204 cut off; pin 5 of phase inverter input port is low level; phase inverter outputs high voltage from pin 6 and MT1389 reset finishes. After reset of MT1389, reset signal is also given to sound D/A conversion chip CS4360 and sound A/D conversion chip CS5340V for their resetting.

3. Key point voltage (unit: V), shown as the following table:

Key Point	Position	Voltage	Remark
DV33 (pointA)	Cathode of diode VD201	3.3V	After power-off, TC217 discharge current from this point
Point B	Anode of diode VD201	After reset finishes, 3.3V	After reset finishes, voltage rises from0V up to 3.3V.
Point C	Pin 5 of phase inverter	After reset finishes, 0V	After reset finishes, voltage decreases from 3.3V down to 0V.

3.2.5 Clock circuit

1. The circuit schematic diagram is shown as the figure 3.2.5.1.

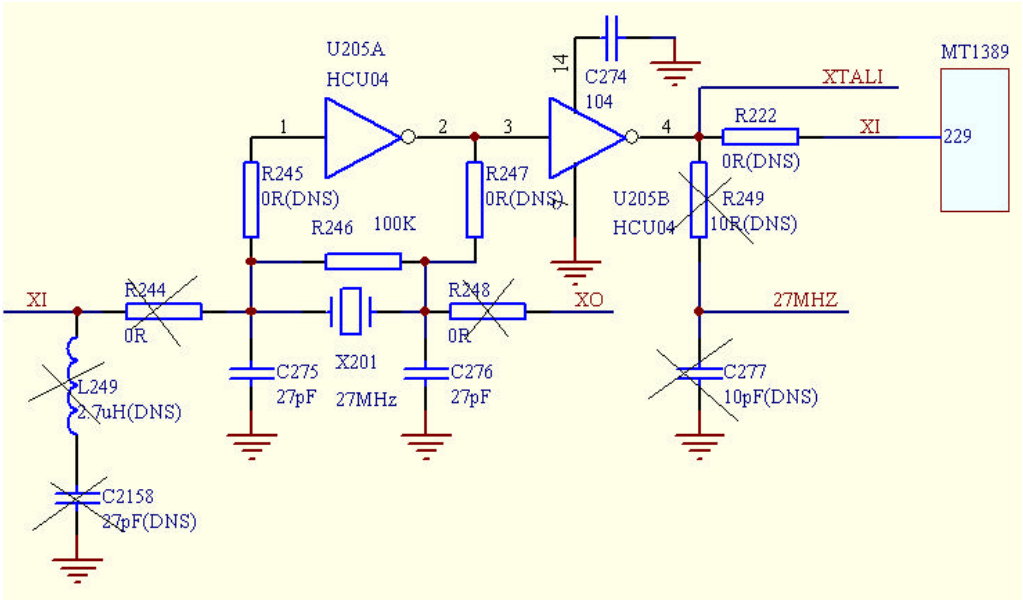


Figure 3.2.5.1 Clock circuit

Note: Elements marked with “X” symbol are those unused in practice.

2. Working principle: 27MHZ clock provides working clock for system. When powering on, capacitor C275 and C276 will generate a concussion, so a vibration occurs on crystal oscillator. After several times of feedback, a stable 27MHZ clock signal is finally generated on crystal oscillator.The function of phase inverter is to increase feedback coefficient and for isolation.

3. This circuit may probably cause these troubles: power supply not connected; not read disc; colour distortion of picture and no colour of picture.

Note: DC voltage of point A and B is 1.47V when in normal working.

3.2.6 Disc in/out circuit

1. The circuit schematic diagram is shown as the following figure 3.2.6.1:

2. Electric current when disc in/out

Open disc tray: VCC→ V306CE electrode on→ LOAD+→ Electric machine→ LOAD- → V308CE electrode on→R326→Ground

When not opening disc tray, pin 51 and 39 of U201 (MT1389) are low level. When opening disc tray, pin 51 of U201 (Mt1389) sends a high level; V308 is on; V308 collector electrode changes into low level;

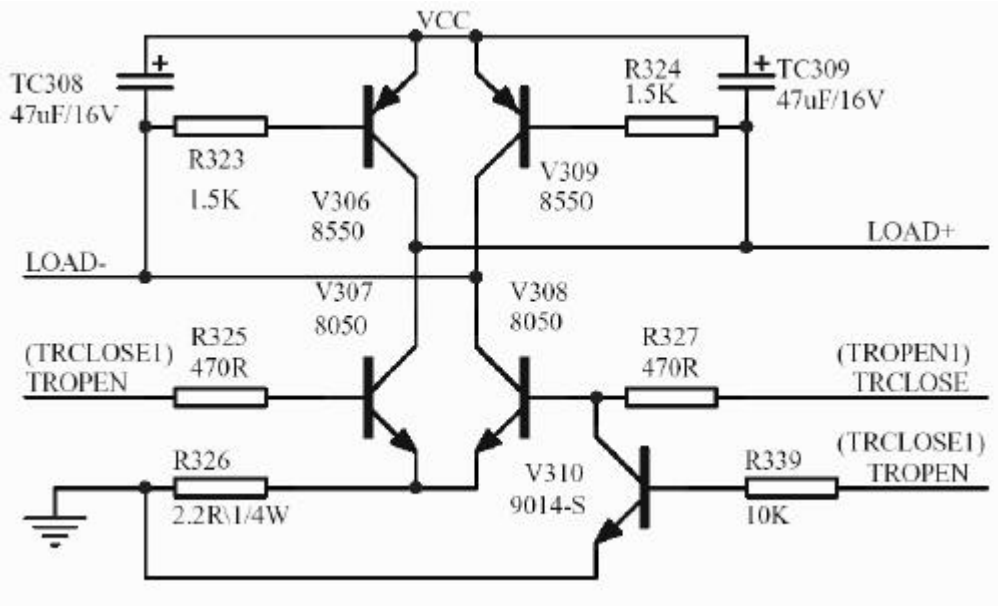


Figure 3.2.6.1 Disc in/out circuit

LOAD- changes into low level; V306 base electrode changes into low level; V306 is on. V306 collector electrode changes into high level and LOAD+ changes into high level.

Close disc tray: VCC→ V309CE electrode on→ LOAD- → Electric machine→ LOAD+ → V307CE electrode on→R326→Ground

when closing disc tray, pin 39 of U201 (Mt1389) sends a high level; V307 is on; collector electrode changes into low level; LOAD+ is low level; base electrode through R324 and V309 is low level; V309 is on; V309 collector electrode changes into high level; LOAD- changes into high level.

3.2.7 Main axis braking circuit

1. The circuit schematic diagram is shown as the following figure 3.2.7.1:

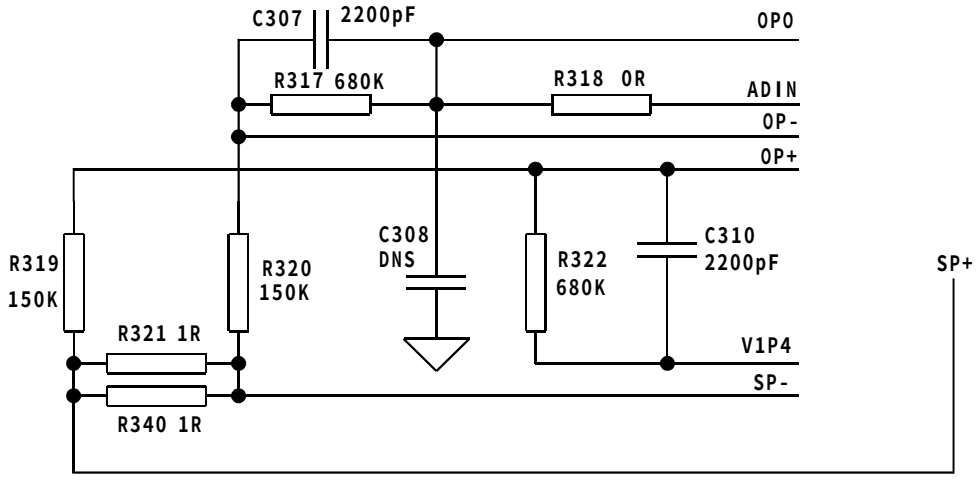
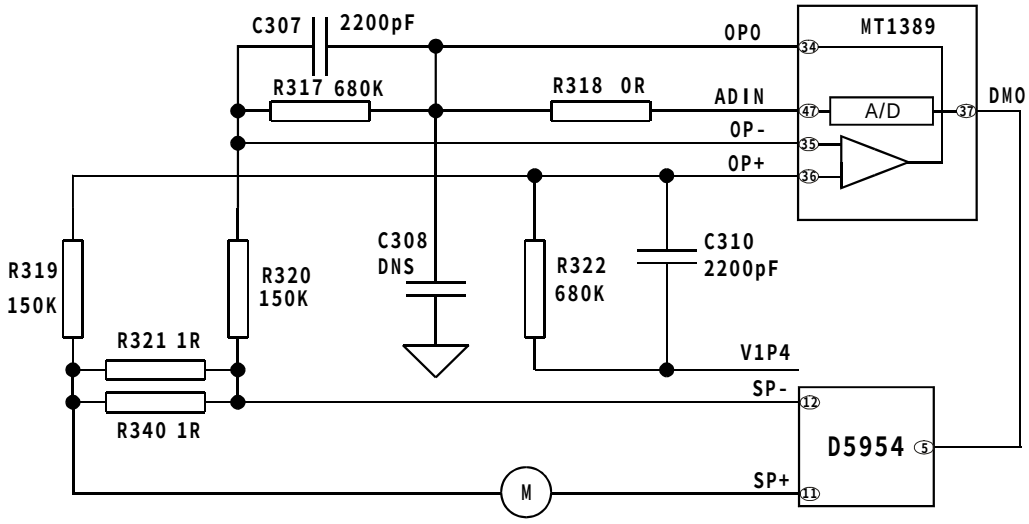


Figure 3.2.7.1 main axis braking circuit disgram

The equivalent circuit is shown as the following figure:



2. Working principle:

To prolong the service life of electric machine and decrease the influence of start-up concussion current to the machine, when there is disc in, the development personnel design the main axis electric machine in running state always. Even though “STOP” button is pressed, disc will not stop running immediately. Thus when pressing “OPEN” button, a braking signal is required to make the main axis electric machine stop running to fulfill the completion of opening disc tray in a short period. In the course of playback,

Press “OPEN" button and main axis drive signal disappears. For the reason of inertia, the main axis electric machine is still in running state, and now the induced voltage achieved by the induced electromotive force which is generated by electric machine's running on sampling resistor R321 and R340 outputs from pin 34 through resistor E319, R320 and pin 36 of MT1389 after being processed inside MT1389 and magnified, then sends to pin 47 of MT1389 through R13; after A/D conversion and the corresponding processing inside MT1389, an instant electric machine reversal braking signal is outputted from pin 37 of MT1389 to make the main axis electric machine decrease speed. When MT1389 detects the disc stops running, disc tray will open to ensure that disc will not run when disc tray opens.

3. Key point voltage (unit: V), shown as the following table:

Key point	Position	Normal working voltage (V)	Voltage change when door is opened (V)
SP+	pin 11 of D5954, pin 5 of XS303	3.79	3.79→0.70→1.80
SP-	pin 12 of 5954, pin 6 of XS303	1.38	1.38→3.40→1.80
OP+	pin 36/B of MT1389	1.38	1.38→3.10→1.80
OP-	pin 35/A of MT1389	1.53	1.53→3.08→1.98

OPO	pin 34/C of MT1389	2.44	2.44→0.40→2.50
ADIN	pin 47/D of MT1389	2.44	2.41→0.41→2.44
DMSO	pin 5 of D5954	1.42	1.42
VIP4	pin 30 of MT1389	1.41	1.41

3.2.8 Mute circuit and power-off quieting circuit

1. The circuit schematic diagram is shown as the following figure 3.2.8.1:

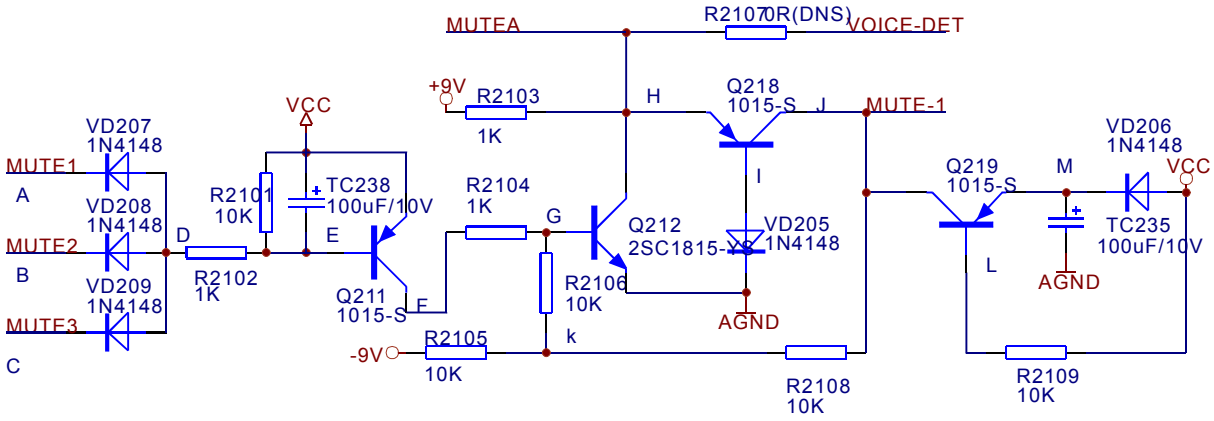


Figure 3.2.8.1 Mute and power-0ff quieting circuit

2. Working principle: under the control of I^2C to MT1389, CS4360 sends 3 mute control signals, MUTE1, MUTE2, MUTE3 from pin 28, 25 and 18 which is added to mute circuit. The generated mute control signal MUTE-1 is added to the base electrode of each switching tubeQ205 - Q210 of 6-path analog channel to make the switching tube and make audio signal bypass into ground to reach the purpose of mute. The working mechanism is that when no audio signal comes to a certain path, CS4360 changes the mute control signal corresponding with this path to high level. After pressing MUTE button, 3-path mute signals all change to high level.

When working normally (playing discs), only one path signal of the 3-path signals, MUTE1, MUTE2 and MUTE3 changes into low level, now Q211 is on. The collector electrode of Q211 is high level; Q212 is also on and its collector electrode is low level; Q218 is cutoff; MUTE-1 is low level and sound outputs normally.

When muting, MUTE1, MUTE2 and MUTE3 outputted by CS4360 all change into high level. At this time, for the base electrode of Q211 is high level, Q211 is cutoff and Q212 is also cutoff. The emitter electrode of Q218 changes into high level and also is on. +9V voltage is added to MUTE-1 through Emitter Collector of Q218, the outputted high level is added to the base electrode of switching tube Q205~Q210. The switching tube is on and sound is bypassed to ground.

Power-off quieting: when working normally, because there is no forward bias, Q219 is in cutoff state. When powering off, +9V disappears and the base electrode of Q219 changes into low level. For capacitor TC235 discharge is high level to the emitter electrode, Q219 is on. The discharge of TC235 makes MUTE-1 outputs high level and add to each switching tube through Emitter-Collector of Q219 to make the switching tube on and sound is bypassed to ground to realize the function of power-off quieting.

Power-on quieting: when powering on, VCC is connected to power supply, voltage of the two ends of Tc238 cannot change suddenly. The base electrode of Q211 changes into about 5V and then Q211 is cutoff, Q212 is cutoff and MUTE-1 changes into about 1.68 to perform power-on quieting function.

The function of -9V voltage in the figure is to ensure the secure cutoff of each switching tube when circuit is working normally.

3. Key point voltage (unit: V), shown as the following table:

KEY POINT	A	B	C	D	E	F	G	H	I	J	K	L	M
NO MUTE	0.02	0.02	0.02	0.53	4.55	5.2	0.84	0.12	-0.15	-4.27	-4.27	5	5
MUTE	5.02	5.02	5.02	5.18	5.23	-3.86	-3.87	1.67	0.81	1.63	-3.87	5	5
INSERT MICROPHONG	0.02	5.02	0.02	0.53	4.52	5.2	0.64	0.12	-0.15	-4.27	-4.27	5	5

3.2.9 Servo circuit

1. DK1005S adopts SANYO 62 decoder and MTK decode solution (MT1389+FLASH (16M)+ SDRAM (64M)). The servo circuit is mainly composed of front signal processing, digital servo processing, signal processing IC T1389 and drive circuit D5954, in which MT1389 is the main component of decode circuit at the same time.

2. The circuit functional block diagram is shown as figure 3.2.9.1.

The Explanation to the block diagram:After powering on or disc in, disc identification circuit identifies the disc inserted into loader, and judges whether the disc is CD or DVD to conduct the corresponding control. At the same time, MT1389 adjusts laser output power through laser power control circuit. Pin 20 of MT1389 is VCD laser power strongness/weakness detecting signal input pin, pin 21 is DVD laser power strongness/weakness detecting signal input pin, pin 23 is VCD laser power drive control output pin and pin 22 is DVD laser power drive control output pin. When reading VCD disc, if pin 20 detects laser output power is too strong, output voltage of pin 23 of MT1389 increases and on-state of V302 decreases to make the voltage provided for pick-up decrease and light emission of laser head become strong.

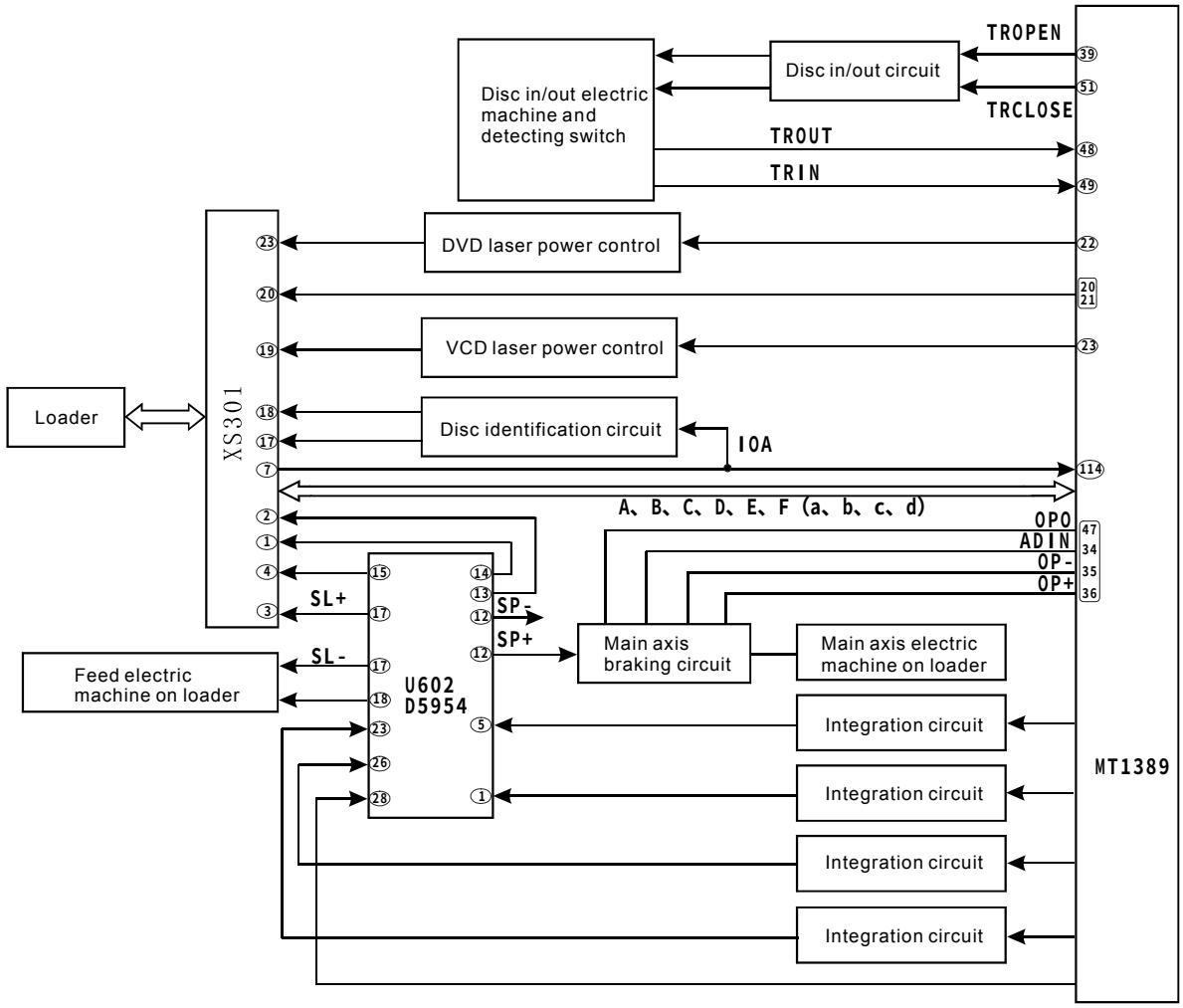


Figure 3.2.9.1 Servo circuit diagram

After loader reading disc information, A, B, C, D, E, F signals are sent out to Mt1389 (DVD only has A, B, C, D signals), and then inputted from pin 2~11, 18, 19 of MT1389. After being amplified and processed by the pre-amplifier inside MT1389, now signals are separated to two part s for processing inside Mt1389:

After being processed by digital servo signal circuit inside MT1389, one part of signal form corresponding servo control signals and output FOO, TRO, DMO, FMO digital servo control signals from pin 42, pin 41, pin 37, pin 38 of Mt1389 respectively, then change into analog servo control signal FOSO, TRSO, DMSO, FMSO through integration circuit composed by resistor capacitor, and send to driver circuit BA5954 for amplification to bring along focus coil, trace coil, main axis electric machine and feed electric machine after drive amplification. Among these, focus and trace servo are used to correct objective position accurately; feed servo is used to bring along laser head to make radial large-scale move which belongs to the preliminary adjustment to pick-up position;and main axis servo is used to control main axis electric machine to make it read signals in means of constant linear velocity and bring along disc to rotate.

After processing of amplification by VGA voltage control amplifier and equalization frequency compensation inside MT1389, another part of signals are changed into digital signals through internal A/D converter. When loader is reading CD/VCD signals, these signals are conducted EFM demodulation inside MT1389, and then outputted to latter stage for AV decoding after finishing CIRC (Cross Interleaved Reed-Solomon Code) error correction inside. When loader is readingDVD signals, these signals are conducted ESM demodulation inside MT1389, and then sent to latter stage for decoding after finishing RSPC error correction inside.

The other part of servo is open/close disc tray circuit. After panel or remote controller emits open/close disc tray signal toMT1389, in usual conditions, TROPEN and TRCLOSE sent out by pin 39, 51 of Mt1389 are both low level, when signal of “open” comes, after Mt1389 makes disc stop rotating through main axis braking circuit, TRCLOSE is set high to make open/close electric machine on loader frame run to bring along dist tray to eject. After disc tray ejecting to proper Signal of opening to proper position (TR_OUT) is set high level (0V) through the detecting switch on loader frame, MT1389 pulls down TRCLOSE and open/close electric machine stop running. When MT1389 receiving “close” signal, TROPEN is set high level by MT1389, open/clode electric machine tuns conversely to bring along disc tray to close. After disc tray closing to proper position, signal of closing to proper position (TR_IN) is set low level through the detecting switch on loader frame, MT1389 pulls down TROPEN and electric machine stops running to finish “close” process.

3. Explanation to servo terms

FOO: when rotating, disc may probably move upwards or downwards slightly to make the focus of laser emitted by pick-up cannot justly fall on data pit of disc, so pick-up is required to move upwards or downwards to make focus aim at data pit justly. When pick-up is moving upwards or downwards, it means that pick-up is making focus acts.

TRO: data information is save in disc in form of tracks. The process when pick-up moves from one track to another one to read data is trace. In this process, it is objective, but the entire pick-up, that moves forwards or backwards, and the moving range is very small.

FMO: similar to acts of trace, the acts of feed are larger than those of trace. Feed conducts a large scale movement firstly, and then trace moves slightly in this range. Feed moves for a while, and does not move for another while; but trace moves all the time. Feed is rough adjustment and trace is fine.

DMO: it is the top that holds up disc. Its rotation speed decides that of disc. Its rotation is generated by an individual DC electric machine, in which rotation speed of DVD is twice over that of CD.

Hint: In order to observe these processes, you may take down upper cover of the machine, and then the loader cover board. When power on with no disc in or disc in after disc out, you may observe that pick-up returns to inner ring firstly and then springs back for a little distance, which is feed process. Then pick-up will emit light and you may notice the objective moves upwards and downwards, which is focus process. In face, in the same time of focus, the objective also moves upwards and backwards to

Make trace acts. Because the range is small, it is not easy to observe, and meanwhile DEMO disc tray also rotates slightly, which is DEMO acts.

3.2.10 Decode circuit

1. Decode circuit block diagram is shown in the following figure 3.2.10.1:

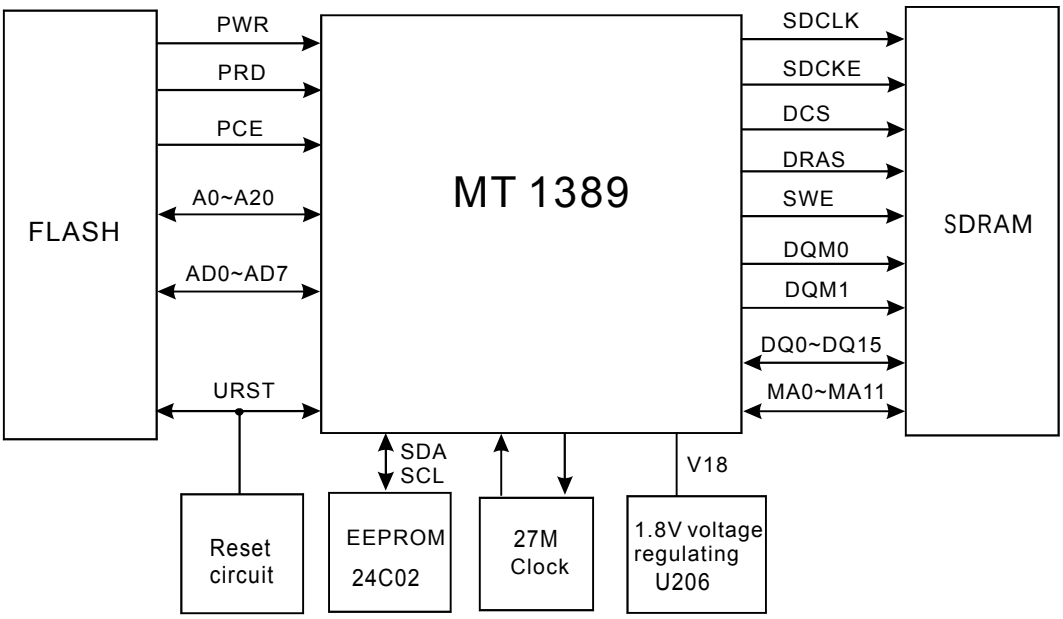


Figure 3.2.10.1 Decode circuit block diagram

2. Working principle: this decode circuit is mainly composed of Mt1389, SDRAM and FLASH. The important conditions for decode circuit working:

(1) Reset: refer to reset circuit working principle for details.

(2) Clock: this system adopts 27M external clock input and produces the clock signal required inside system through internal frequency doubling circuit.

(3) Power: decode chip adopts two groups of power supply: 3.3V and 1.8V, in which 1.8V is provided for internal logic control circuit, so we call care voltage.

After power on, reset circuit performs reset to CPU (8032) and FLASH inside Mt1389, decode chip outputs reset signal at the same time to perform reset to other circuit. After system reset, read signal is sent out to FLASH to read the information saved in FLASH and machine displays power on picture. Servo system begins to work to check whether machine closes to proper position and whether switch is turned off, if not, close action is performed. After door detect switch is turned off, the machine begins to carry out the preparation work for reading disc and panel display at the same time.

Playback process: laser head picks up disc signal from disc, after being processed by servo system, and sends it to decode circuit for decoding, and signal after being decoded is saved in SDRAM

Temporarily; when machine needs to replay signal, decode circuit calls the information inside SDRAM for output.

Save user's information: information set by user is saved inside EEPROM, if users do not renew ot reset this information, it will be saved inside IC forever.

Audio, video output circuit: at present, MT1389 integrates to video D/A converter, MT1389E integrates audio D/A converter inside, and manufactures may select according to their own needs, so when decode audio outputs, part of analog output is digital output. Please refer to circuit diagram and audio circuit introduction for details.

3.2.11 Video circuit

1. The circuit functional block diagram is shown as the figure 3.2.11.1:

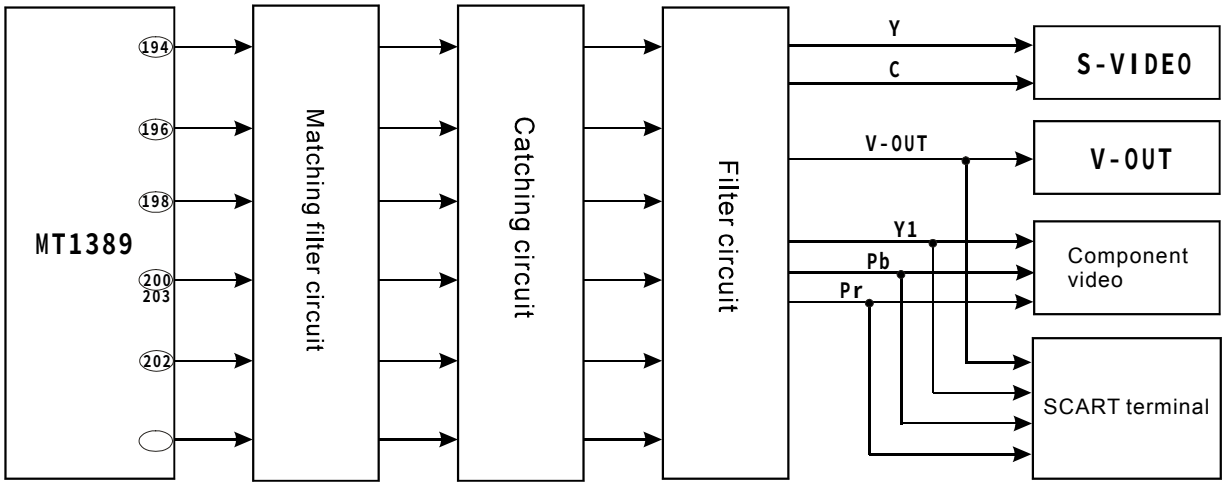


Figure 3.2.11.1 Functional block diagram of video

Brightness signal, colour difference signal, CVBS signal and component video signal after being decoded by U201 (MT1389) are sent out to the corresponding terminal for output after lowpass filtering and clipping. Take C signal as an instance, the following figure 3.2.11.2 shows the working principle of filtering limiter circuit.

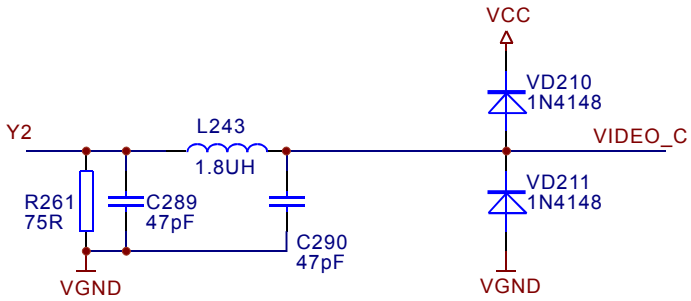


Figure 3.2.11.2 C signal circuit diagram

2. Working principle: R261 is a matched resistor, which makes the signal achieve the maximum power on load. Capacitor C289, C290 and inductor L243,compose a lowpass filter which filters the high frequency interference signals beside useful ones; diode Vd210 and Vd211 compose a limiter circuit. It is known from features of diode that the maximum amplitude of colour difference signal C cannot exceed 5.7V and the minimum one cannot be under -0.7V, thus the high voltage signal from TV set can be avoided burning down the player. Please refer to video signal flow diagram for details.

3. Key point voltage (unit: V) is shown as the following table:

Signal	Function	Trouble	No disc	In playing
Y	S-VIDEO brightness	S-video has no picture/picture bright/picture dark	0.74/0.65	1.44
C	S-VIDEO chroma	S-video has no clolr/color distortion	1.48	1.48
VIDEO	Compound signal of component video	Composite video has no picture/picture bright/picture dark	0.64	0.66
Y1	Brightness signal of component video	Component video has no picture/picture bright/picture dark	0.78/0.67	0.56
Pb	Chroma signal of component video	Component video color distortion	1.76/1.46	0.71
Pr			1.5	0.77

Note: In "No disc" column, "/" symbol refers to the data when blue screen is changing into black screen.

The above measurement are all those when connecting with load.

3.2.12 Audio circuit

1. The function of connect signal between MT1389 and Cs4360 is shown as the following

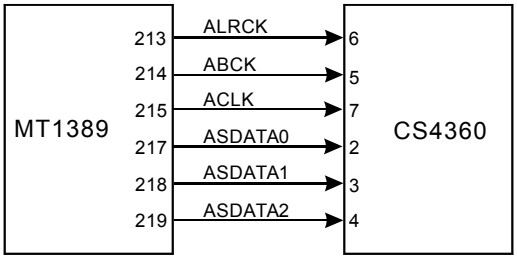


Figure 3.2.12.1 Diagram about the connection between MT1389 and Cs4360

2. Explanation to signal function is shown as the following table:

Signal	Name	Relevant function	Signal	Name	Relevant function
ALRCK	Left/right bit clock signal	Use to separate left and right channels	ASDATA0	Digital audio signal	includes left/right channel signal
ABCK	Bit clock signal	Use to ensure the accuracy of signal transmission	ASDATA1	Digital audio signal	includes surround left/right channel signal
ACLK	External clock signal	working clock of CS4360	ASDATA2	Digital audio signal	includes centre/subwoofer channel signal

3. Functional block diagram of audio circuit is shown as the figure 3.2.12.2.

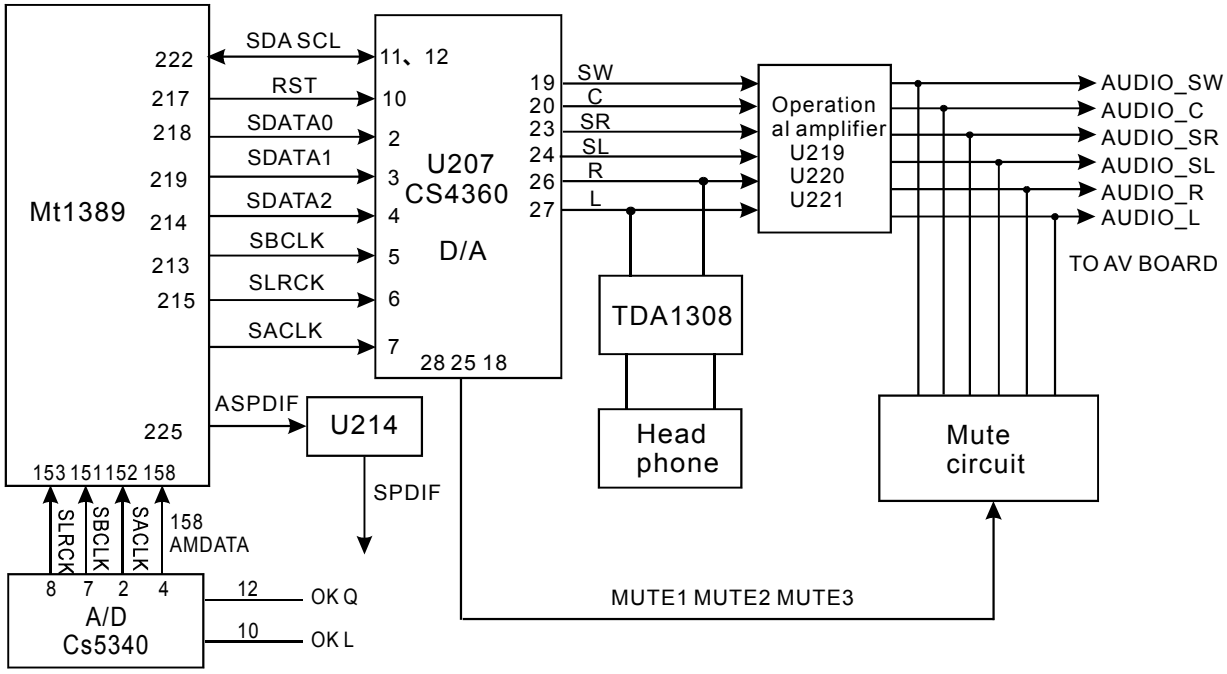


Figure 3.2.12.2 Functional block diagram for audio circuit

4. Working principle: digital audio signals SDATA0, ASDATA1 and ASDATA2 after being decoded by U201 (MT1389) are outputted to pin 2, 3 and 4 of U207 (CS4360) from pin 217, 218 and 219 of U201 (MT1389) respectively, among which the function of 33ohm resistor is to prevent electromagnetic interference. The above three-path digital signals, through CS4360 D/A conversion, output left/right channel analog audio signal from pin 27 and 26; output left/right channel mute control signal MUTE1 from pin 28; output surround left/right channel analog audio signal from pin 24 and 23; output surround left/right channel mute control signal MUTE2 from pin2;

output centre subwoofer analog audio signal from pin 20 and 19 and output centre subwoofer mute control signal MUTE3 from pin 28. When a certain path signal has input, the corresponding analog signal of this path has output, and the corresponding MUTE signal is low level, or else it is high level.

He used three-path clock signals of U207 (CS4360) are the same with those of U210 (CS5340). U210 (CS5340) is to converse the analog OKA into digital signal and then output from pin 4 of U210 (CS5340), then into pin 224 of MT1389 and form echo with OKA signal which is connected to the operational amplifier after being processed inside U201 (Mt1389).

3.2.13 Power circuit

1. The circuit functional block diagram is shown as the figure 3.2.13.1:

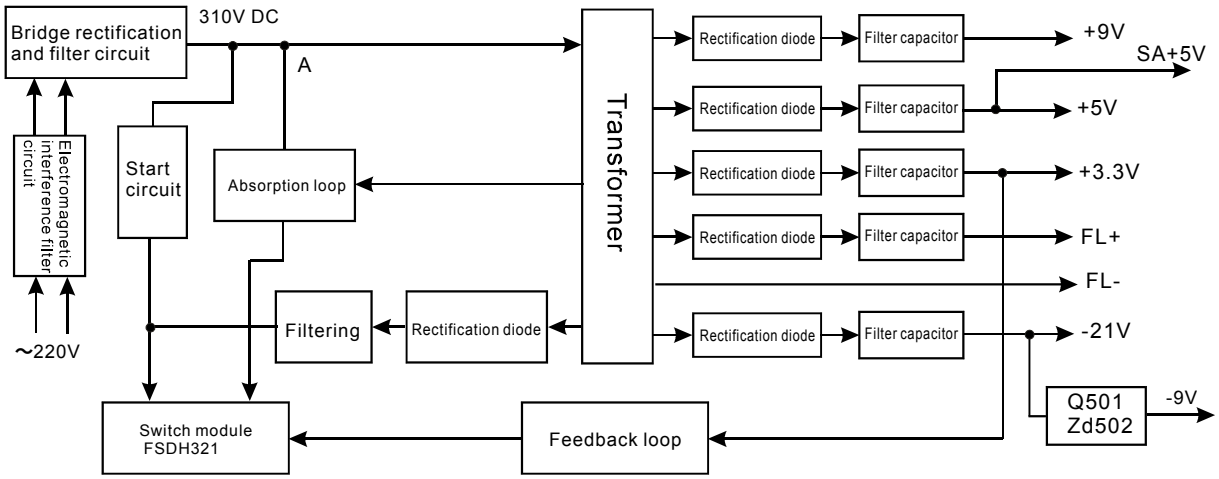


Figure 3.2.13.1 Power circuit flow chart

2. Working principle

A: The working range of this switch power is AC 110V~250V. The voltage value here is 1.414 times of effective AC value.

(1) Electromagnetic interference filter circuit: for various electromagnetic radiation exits in surroundings, the inputted current will be disturbed. The function of electromagnetic filter circuit is to remove these interferences by filtration to make those which enter the bridge rectification circuit are relatively pure 220V AC.

(2) Bridge rectification and filter circuit: the function of this circuit is to generate a DC about 310V to provide usage for future.

(3) Start circuit: when power-on just starts, transformer has not started working, and now the start circuit provides a power supply voltage for FSDH321 to make it work.

(4) Absorption loop: The waveform of pin 2 of switch module FSDH321 sometimes is high level, and sometimes is ow level, so a strong self-induction voltage will generate in primary coil of transformer and FSDH321 may probably be caused damage. The function of absorption loop is to form a loop for this self-induction to ensure the normal working of circuit.

(5) Rectification diode: The voltage which is just outputted from transformer is pulsating DC. The function of rectification diode is to change pulsating DC into DC together with the later filter circuit.

(6) Feedback loop: The length of time of “on’ and “off” within the same cycle inside switch module FSDH321 is decided by the feedback loop. Feedback loop samples the +3.3V output port voltage. When the output port voltage is too high, the sampled voltage is on the high side. Through feedback loop, it changes the ratio of occupying space of pin 2 of FSDH321 to decrease the time of on-state. The coupling quantity of transformer decreases and outputted voltage starts decreasing. When the outputted

Voltage is too low, the sampled voltage is on the low side. Through feedback loop, it makes the ratio of Occupying space of FSDH321 increase. The coupling quantity of transformer increases and outputted voltage starts increasing. Through the function of feedback loop, it makes power board output relatively stable voltage. LM431 used in this power supply is a 2.5V comparison device, which is compared with sampling voltage. When sampling voltage is more than 2.5V (means output voltage is on high side), LM431 is on, and light emitting diode in photoelectric coupler starts emitting light to make the other side of photoelectric coupler starts being on. The light emission of light emitting diode is stronger, the on-state degree is larger. The on time of switch module FSDH321 decreases, the coupling quantity of transformer decreases and the outputted voltage starts decreasing. When sampling voltage is less than 2.5V (means output voltage is on low side), LM431 is cutoff. The on time of FSDH321 decreases, the coupling quantity of transformer decreases and output voltage starts increasing. Through auto control function of feedback loop, it makes power board output relatively stable voltage.

(7) Filter circuit: its function is to generate a stable and small-curve DC voltage. "Π" shaped filter is usually adopted in filter circuit. The feature of capacitor filtering is that load resistance is high. When current is small, the function of filtering is obvious. But the feature of inductor filtering is that load resistance is small. When current is large, the function of filtering is obvious. If the capacitor is constructed to "Π" shaped filter, it can perform better filtering effect.

3.2.14 MIC circuit

1. MIC circuit block diagram is shown in the following figure 3.2.14.1:

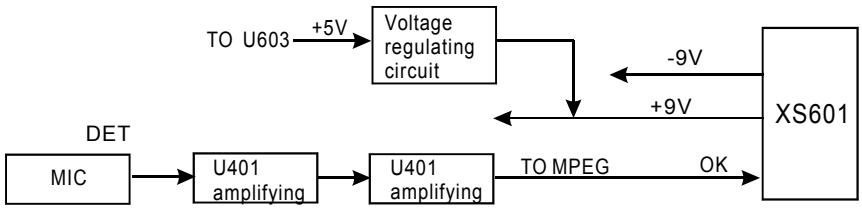


Figure 3.2.14.1 MIC circuit block diagram

2. Working principle: MIC part: when microphone is inserted into MIC left, DET signal changes from low level to high level, which makes mute circuit of decode part off, no matter disc reading is available, audio signal may output. If this signal has trouble, MIC will have no sound when playback stops. After being filtered, signals inputted in MIC transmit to pin 5 of U601, and signals after discharge output from pin 7 of U601, after being amplified for the second time, they are outputted from pin 1 of U601 to decode board directly for Karaoke signal processing and output overlapped with audio signal to realize Karaoke function.

3.2.15 Headphone circuit

1. Headphone circuit block diagram is shown in the following figure 3.2.15.1:

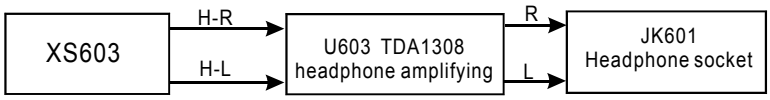


Figure3.2.15.1Headphone circuit block diagram

2. Working principle: H_L/H_R signal of audio output end transmits to headphone amplifying circuit of MIC board through XS603 and headphone amplifying circuit is mainly composed of U603 (TDA1308). Function of main pins of TDA1308: pin 1, 7 is output pin; pin 6, 2 is input pin. After being amplified, audio signals output to headphone socket (JK601) directly.

3.2.16 panel control circuit

1. The circuit functional block diagram is shown as the following figure 3.2.16.1:

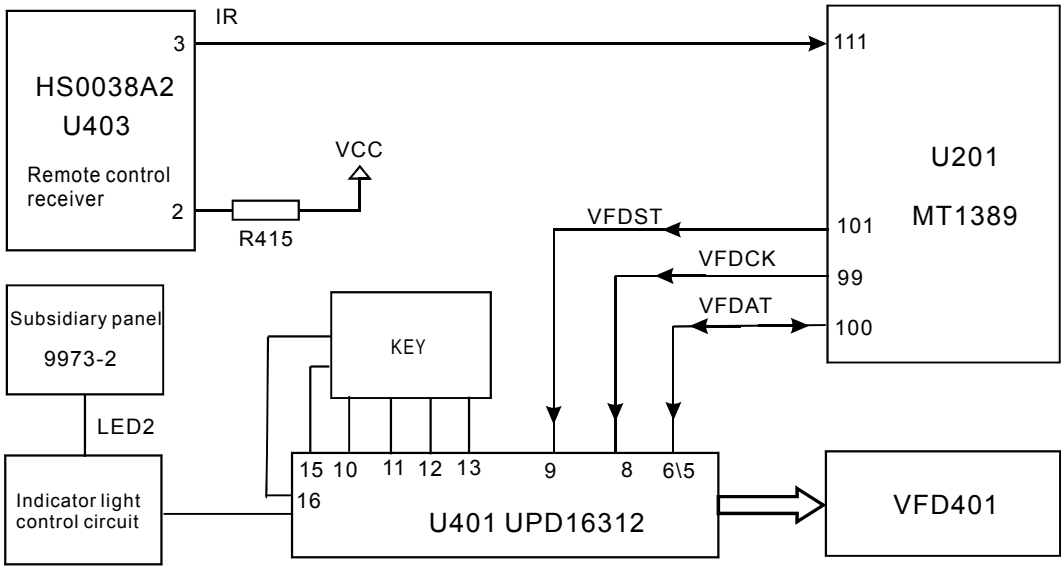


Figure 3.2.16.1 Panel control circuit diagram

2. Working principle: control panel components are composed of VFD screen, drive IC U401 (UPD6312), remote control receiver HS0038A2, buttons and indicator light. U401 (UPD6312) processes the data sent by decode board, and drive display screen displays the corresponding state information; meanwhile,scans panel buttons matrix and sends to U201 (MT1389) after processing buttons information to realize the control to the player by users.Pin 3 of remote control receiver sends the remote control information to U201 (MT1389) to realize remote control function. It has three pin in all, in which pin 1 grounding, pin 2 provides 3.3V voltage and pin 3 IR outputs to decode board.

3.2.17 AV output circuit

1. Shown in the figure 3.2.17.1, this board（7969-5） is mainly composed of output terminal, SCART output switch circuit and filtering circuit. Main functions: output audio and video signals. Video part includes S-video, component video, composite video output. Audio part includes left/right channel, surround left/right, centre, subwoofer and coaxial cable output. SCART terminal integrates cideo and audio output in one.

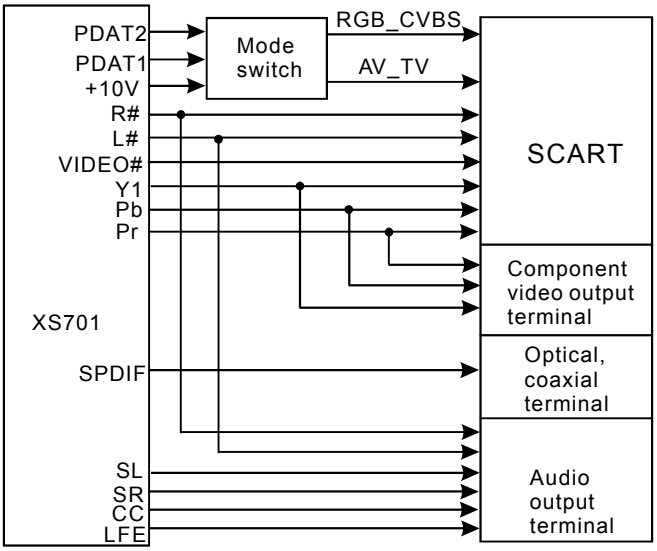


Figure 3.2.17.1 AV output board circuit block diagram

2. SCART terminal

SCART terminal is the one that integrates video and audio transmission together, which can transmit video and audio signal, and also the operation is very convenient. There are 21 holes in all locating in the centralpart at the rear side of the player.

(1) Explanation to SCART terminal pin function is shown as the following table:

Pin	Name	Signal direction	Function description	Pin	Name	Signal direction	Function description
1	A(B)OUT	I	Audio right channel input	12	NC		Network communication data line 2
2	A(B)IN	O	Audio right channel output	13	RETURN		Pr signal ground
3	A(A)OUT	I	Audio left channel input	14	RETURN		Blanking signal ground
4	A-COM		Audio signal ground	15	RED I/O	I/O	Pr signalI/O port
5	RETURN		Pb signal ground	16	BLK I/O	I/O	Blanking signal I/O port ★
6	A(A)IN	O	Audio left channel output	17	RETURN		Blanking signal ground
7	BLUE I/O	I/O	Pb signalI/O port	18	TRTURN		Composite video signal ground

8	FUNCSW	I	Function selection jack	19	V-OUT	I	Composite video signal input
9	RETURN		Y1 signal ground	20	V-IN	O	Composite video signal output
10	CONT	I/O	Network communication data line 2	21	GND		Common
11	GREEN I/O	I/O	Y1 signal I/O port				

(3) SCART terminal function selection is shown as the following table:

PDATO	PDAT1	PDAT2	Pin 8 of SCART terminal	Function
0	×	0	10V	AV4:3
0	×	1	7.5V	AV16:9
1	×	0	0.90V	TV
1	×	1	0.85V	TV
×	0	×	×	CVBS MODE
×	1	×	×	RGB MODE

Note: PDAT0 and PDAT2 are used to control input voltage of pin 8 of SCART terminal; PDAT1 is used to control voltage change of pin 16 of SCART terminal and the voltage on pin 16 controls SCART terminal to select RGB mode or CVBS mode.

Section Three Servicing Cases

3.3.1 Servicing cases

【Example 1】Symptom: power on automatically

Description: after connecting to power, do not press POWER button, power indicator light is on and machine starts up at the same time.

Analysis and troubleshooting: use multimeter to test each channel voltage output of power board and find that there is no CPU3.3V, other channels are normal; check elements in this channel and they are all normal; test pin 9 of transformer and find that there is no voltage output; after checking, open circuit happens between pin 9 and 13 of transformer; after changing transformer, trouble is removed.

【Example 2】Symptom: loader is loud

Analysis and troubleshooting: after closing to proper position, loader gives a click sound; check loader and find that after laser head reset is ok, it does not retract quickly, but in reset all the time; push laser head close to main axis electric machine, use multimeter to test pin 3 (LIMIT) of Xs306 and it has open circuit to ground; check feed switch and find that this switch has lost effect; after changing switch, machine is OK.

【Example 3】Symptom: door not open

Description: light emission, main axis and feed are all normal; press OPEN button but not any acts happens.

Analysis and troubleshooting: use multimeter to test the voltage output of pin 3 of the 5P flat cable XS306 from frame to decode board (open to proper position test) and it is +1.6V, which should be +3.3V; test the resistor from pin 3 to 1389 and it is 330 ohm without trouble, so we doubt that 1389 has trouble; after changing 1389, machine is ok.

【Example 4】Symptom: no picture, no sound and no screen display

Step 1: check all voltage of X203, and they are all normal.

Step 2: check output voltage of U209 (1.8V voltage regulator) and it is 1.9V, which is normal; check pin 37 of U214 (flash) and it is 3.23V, pin 1 of U211 (SDRAM) is 3.19V, pin 14 of U205 (HCU204); pin 8 of U202 (24LLC02) and it is 3.21V, which is normal.

Step 3: use oscillograph to test frequency of crystal oscillator X201 and find that there is no waveform; check start-up capacitor C275 and C276 and find that resistance of two ends of C275 is 100 ohm, so this capacitor has electric leakage; after changing it, the machine is ok.

【Example 5】Symptom: component vide has no output

Step 1: after checking, we find that composite video is normal, so we can preliminarily determine that component video output part has trouble.

Step 2: use oscillograph to test 3 component video output pins of pin 200 (Y4) of U201 (Mt1389), pin 202 (Y5) and pin 203 (Y6, and we find 3 have waveform output, so we may judge that trouble does not lie in Mt1389, but in output circuit.

Step 3: in the 3 component video, only when brightness signal has trouble, there is no output, so we directly check the path of brightness signal. Check brightness signal Video-Y4 of pin 11 of flat cable holder XS204 and find that there is no waveform output, so we can judge that trouble lies in decode board.

Step 4: check anode of catching diode V216, shown in the figure 3.6.1, and there is still no waveform, so we can confirm that trouble lies in filtering circuit n=matching resistor. R273 is matching resistor, Vd216 and Vd217 are catching diode, and L246, 213, C298, C299 comprise filtering circuit.

Step 5: use multimeter to test above circuit elements and no problems are found, but in the above circuit, point A has no waveform; carefully observe L246 and it has rosin joint; after well welding it, component video output resumes normal.

【Example 6】Symptom: color distortion of component video

Step 1: use oscillograph to check YpbPr terminal and find that Pb terminal has no signal output.

Step 2: use oscillograph to check Y5 signal (pin 202 of 1389 or high level end of R276), and no abnormality is found.

Step 3: use oscillograph to check VIDEO-U signal (Vd218 anode) and VIDEO-U and they are normal.

Step 4: use oscillograph to check two ends of L247, L214 and find that L247 has open circuit; after changing L247, machine is normal.

【Example 7】Symptom: component video has no output

After checking, composite video output is normal, when using oscillograph to test pin 200, 202 and 203 of MT1389, they all have no output; composite video is normal, so we preliminarily judge that trouble does not lie in clock circuit and power supply circuit; change MT1389 directly and component video output resumes normal.

【Example 8】Symptom: there is picture but no sound

Step 1: all channels have no sound, so trouble is certain to lie in the common part of these channels. Common part of these channels: 1. Power supply voltage of 4558. 2. MUTE-1 signal in mute. 3. CS4360 has trouble. 4. MT1389 has trouble.

Step 2: check power supply voltage (±9V) of 4558 from simple steps and it is normal.

Step 3: use multimeter to test C electrode of voltage Q218 of MUTE-1 signal and it is high level (1.68V), so trouble may probably lie in mute circuit.

Step 4: in mute circuit, to make MUTE-1 be 1.68V, Q212 is sure to be cutoff. To make Q212 cut off, cathode of VD207, VD208, VD209 must be high level; but when using multimeter to test cathode of VD207, it is low level, Q212 should be on in normal conditions; so we decide that Q212 may probably have trouble.

Step 5: change Q212 and trouble is removed.

【Example 9】Symptom: mixed right channel has no sound.

Step 1: use oscillograph to check R terminal and confirm that there is no output.

Step 2: use oscillograph to check pin 26 FR signal of U207 (CS4360) and output is normal.

Step 3: check waveform of RT signal (pin 19 of XS204 or C electrode of Q205C) and it is normal.

Step 4: check waveform of pin 1 of U219 (4580) and the output is normal.

Step 5: use multimeter to check C electrode resistance to ground of Q205 and it is zero, so we doubt Q205 has trouble; after changing Q205, machine is normal.

【Example 10】Symptom: power not on after switching on machine

Step 1: check voltage of pin 7 (5V), pin 9 (3.3V) and pin 11 (5V) of Xs203 and it is normal, so ie is estimated that trouble lies in decode board.

Step 2: check voltage of pin 2 of U209 and it is 0V (which should be 1.9V in normal condition).

Step 3: check R242 and R243 resistance and it is normal, so we estimate that U209 is damaged.

Step 4: after changing U209, machine is normal.

【Example 11】Symptom: there is picture but no sound

Step 1: each channel has no sound, so trouble lies in the common part of each channel.

Step 2: check mute signal MUTE-1 (one end of R2118) and it is -0.98V, which is normal.

Step 3: check power supply of U207 (CS4360) and it is normal.

Step 4: use oscillograph to test pin 26, 27 of U207 (Cs4360) and find that there is no waveform output; use oscillograph to test pin 2 of U207 (Cs4360) and there is waveform input, so we preliminarily judge that U207 has trouble.

Step 5: after changing U207 (Cs4360), trouble is removed.

【Example 12】Symptom: not read disc

Step 1: check the nerve flat cable socket on Xs301 and no abnormality is found.

Step 2: change loader, disc reading is normal and trouble is removed.

【Example 13】Symptom: not read disc

Step 1: check Xs301 flat cable and socket and there is no abnormality.

Step 2: change loader but trouble still exists.

Step 3: check power supply, observe laser head main axis and feed and they are normal, but no focus.

Step 4: check D5954 power supply and reference voltage and they are both normal.

Step 5: check MT1389 power supply with reference to “MT1389 power supply troubleshooting”.

Step 6: check the path between pin 42 (focus error signal output) of MT1389 and pin 1 of D5954, after changing C213, trouble is removed, so it shows that C213 has electric leakage.

【Example 14】Symptom: not read disc

Step 1: check flat cable and socket on XS301 and there is no abnormality; change loader and trouble still exists.

Step 2: when no disc in, after closing door, we find that when lease head is making focus and trace acts, the emitted DVD light is not strong enough, so we preliminarily judge that laser power control circuit has trouble.

Step 3: when using multimeter to test V301 and V302, we find that V301 is stricken through; after changing V301, trouble is removed.

【Example 15】Symptom: machine down in the course of playing

According to former experience, this type of trouble may probably occur in MT1389, so change MT1389 directly and trouble is removed.

Conclusion: for this type of trouble, firstly change Mt1389, if trouble cannot be removed, change U211 (SDRAM), if it cannot be removed again, change U214 (FLASH).

【Example 16】Symptom: power not on

Step 1: check voltage on XS203 flat cable holder and all are normal; check power voltage on U201 (MT1389), U211 (SDRAM), U214 (Flash), U202 (24LLC02) and it is also normal.

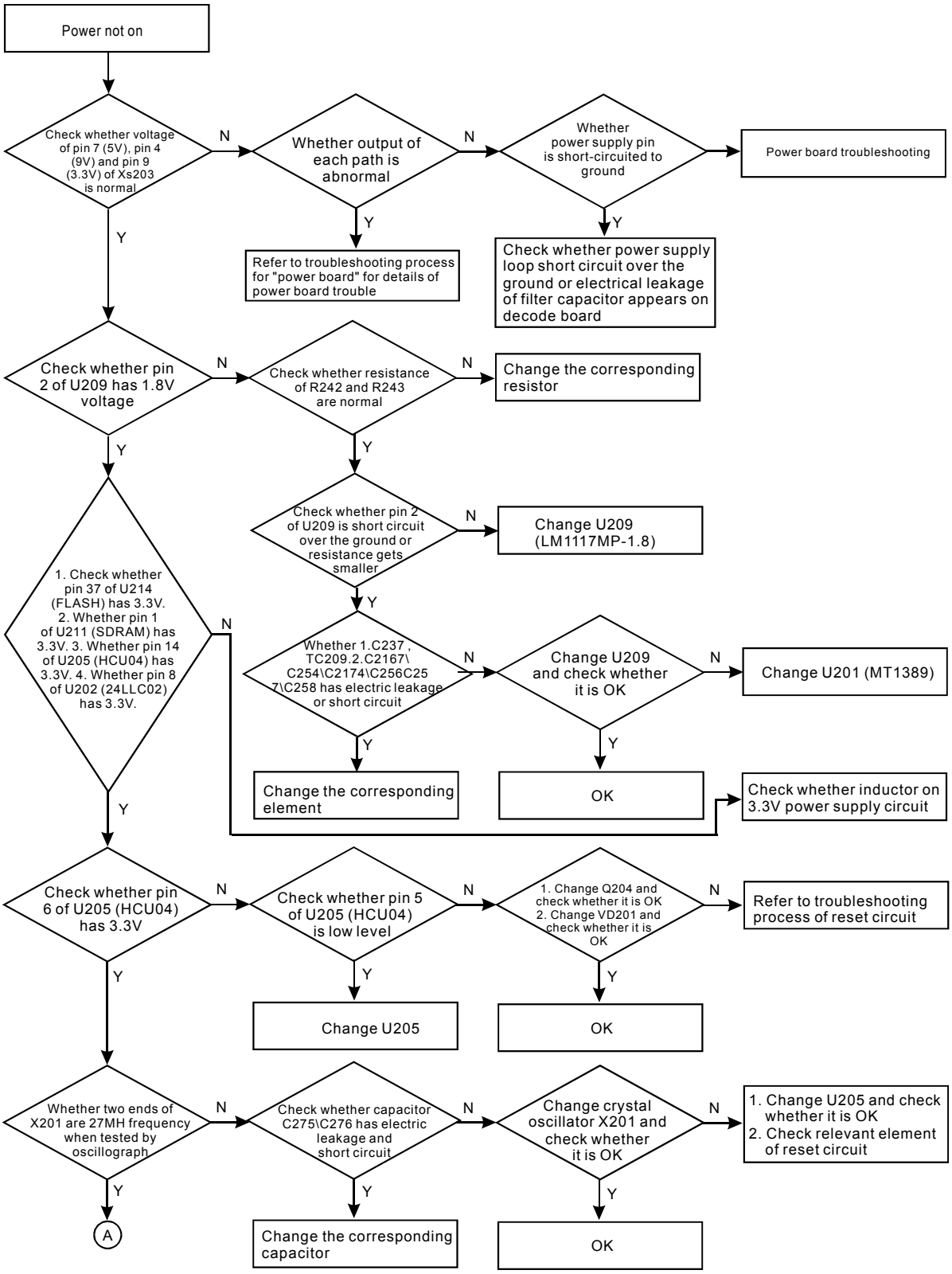
Step 2: check reset circuit, and reset by force, and power is still not on; check clock circuit and clock frequency is normal.

Step 3: change U217 (flash) and trouble is removed.

Conclusion: when power supply, reset and clock are all normal, for this type of trouble, firstly change U214 (flash), and then U201 (MT1389) or U211 (SDRAM).

3.3.2 Troubleshooting flow chart

1. Troubleshooting process for “Power not on” is shown in the following figure 3.3.2.1:


Power not on
Check whether voltage of pin 7 (5V), pin 4 (9V) and pin 9 (3.3V) of Xs203 is normal
N
Whether output of each path is abnormal
N
Whether power supply pin is short-circuited to ground
Power board troubleshooting
Y
Y
Y
Refer to troubleshooting process for "power board" for details of power board trouble
Check whether power supply loop short circuit over the ground or electrical leakage of filter capacitor appears on decode board
Check whether pin 2 of U209 has 1.8V voltage
N
Check whether resistance of R242 and R243 are normal
N
Change the corresponding resistor
Y
Y
Check whether pin 2 of U209 is short circuit over the ground or resistance gets smaller
N
Change U209 (LM1117MP-1.8)
Y
1. Check whether pin 37 of U214 (FLASH) has 3.3V. 2. Whether pin 1 of U211 (SDRAM) has 3.3V. 3. Whether pin 14 of U205 (HCU04) has 3.3V. 4. Whether pin 8 of U202 (24LLC02) has 3.3V.
N
Whether 1.C237 , TC209.2.C2167\ C254\C2174\C256C25 7\C258 has electric leakage or short circuit
N
Change U209 and check whether it is OK
N
Change U201 (MT1389)
Y
Y
Y
Change the corresponding element
OK
Check whether inductor on 3.3V power supply circuit
Y
Check whether pin 6 of U205 (HCU04) has 3.3V
N
Check whether pin 5 of U205 (HCU04) is low level
N
1. Change Q204 and check whether it is OK 2. Change VD201 and check whether it is OK
N
Refer to troubleshooting process of reset circuit
Y
Y
Y
Change U205
OK
Whether two ends of X201 are 27MH frequency when tested by oscillograph
N
Check whether capacitor C275\C276 has electric leakage and short circuit
N
Change crystal oscillator X201 and check whether it is OK
N
1. Change U205 and check whether it is OK
2. Check relevant element of reset circuit
Y
Y
Y
A
Change the corresponding capacitor
OK

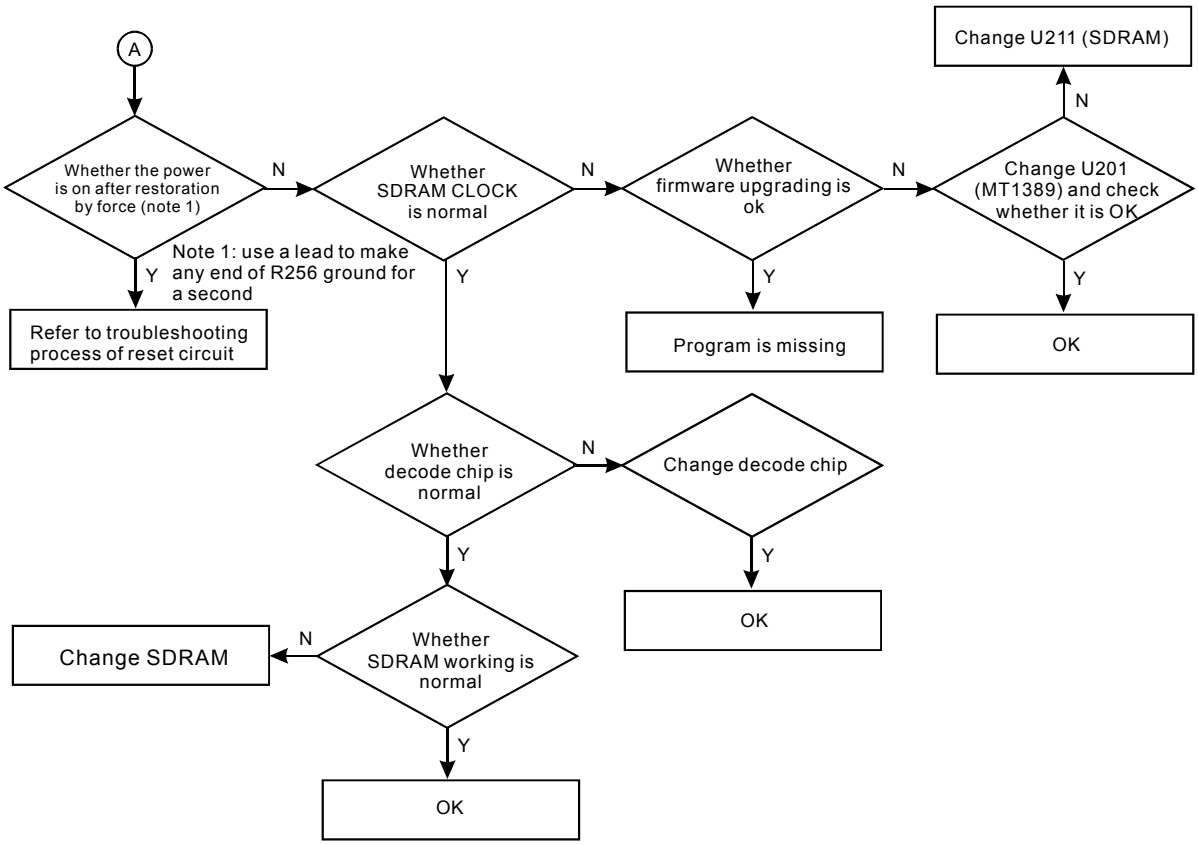


Figure 3.3.2.1 Troubleshooting flow chart for “Power not on”

2. Troubleshooting process for “Picture has distortion” is shown in the following figure 3.3.2.2:

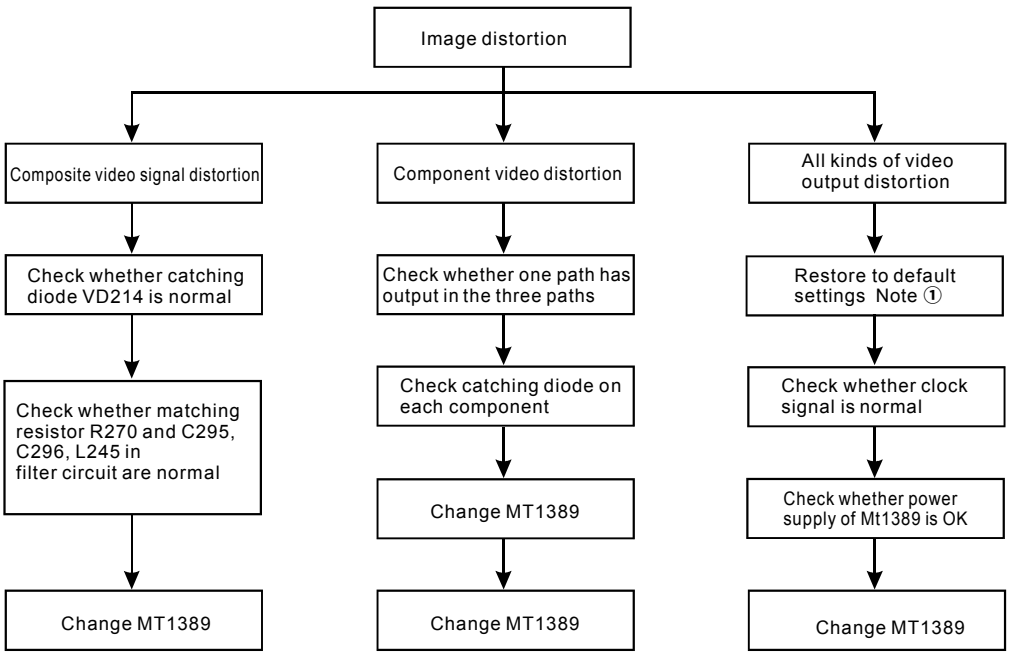


Image distortion
Composite video signal distortion
Component video distortion
All kinds of video output distortion
Check whether catching diode VD214 is normal
Check whether one path has output in the three paths
Restore to default settings Note ①
Check whether matching resistor R270 and C295, C296, L245 in filter circuit are normal
Check catching diode on each component
Check whether clock signal is normal
Change MT1389
Check whether power supply of Mt1389 is OK
Change MT1389
Change MT1389
Change MT1389

Figure 3.3.2.2 Troubleshooting flow chart for “Picture has distortion”

Note: ① Flow chart of restoring to default settings is shown as figure 3.3.2.3:

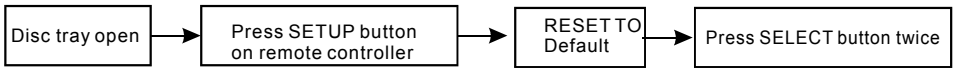


Figure 3.3.2.3 Operation flow chart for restoring to default settings

3. Troubleshooting flow chart for “Having picture but on sound” is shown as the figure 3.3.2.4:

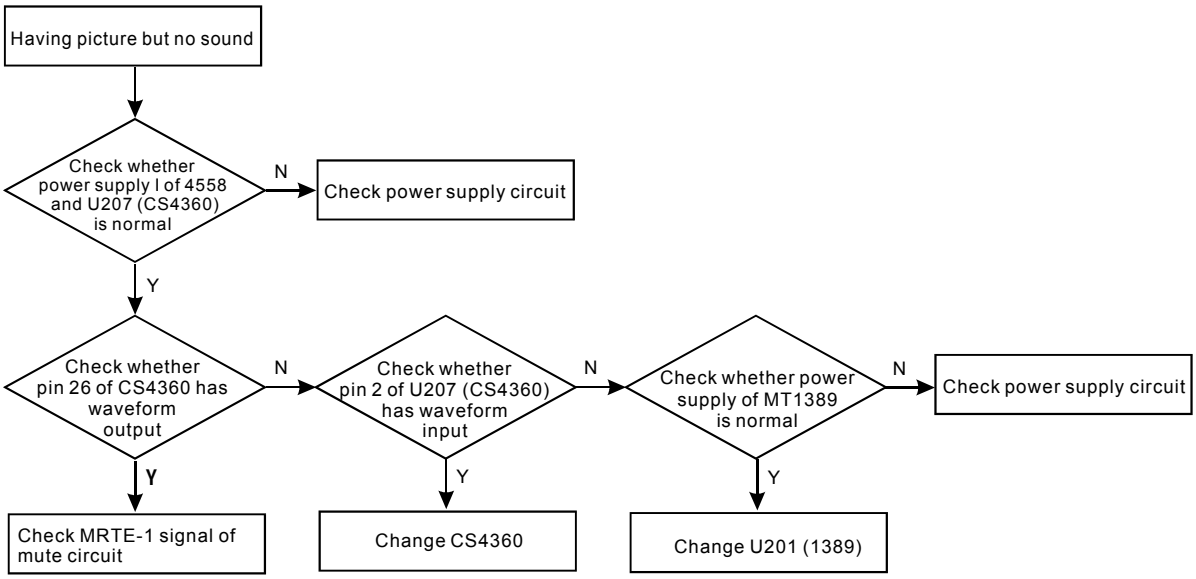


Figure 3.3.2.4 Troubleshooting flow chart for "Having sound but no sound"

4. Troubleshooting process is shown as the following figure 3.3.2.5:

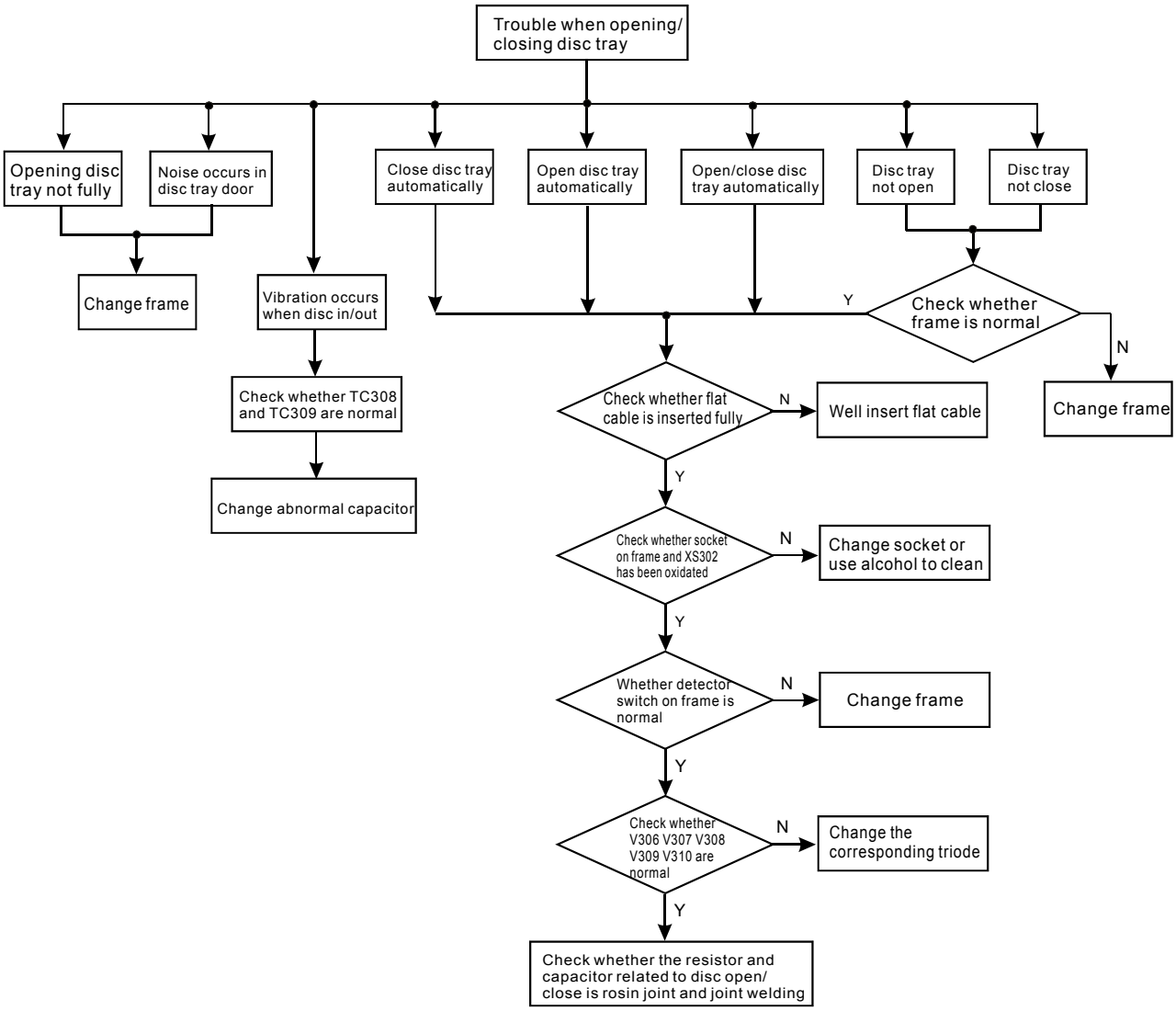

Trouble when opening/ closing disc tray
Opening disc tray not fully
Noise occurs in disc tray door
Close disc tray automatically
Open disc tray automatically
Open/close disc tray automatically
Disc tray not open
Disc tray not close
Change frame
Vibration occurs when disc in/out
Y
Check whether frame is normal
N
Change frame
Check whether TC308 and TC309 are normal
Check whether flat cable is inserted fully
N
Well insert flat cable
Change abnormal capacitor
Y
Check whether socket on frame and XS302 has been oxidated
N
Change socket or use alcohol to clean
Y
Whether detector switch on frame is normal
N
Change frame
Y
Check whether V306 V307 V308 V309 V310 are normal
N
Change the corresponding triode
Y
Check whether the resistor and capacitor related to disc open/ close is rosin joint and joint welding

Figure 3.3.2.5 Troubleshooting flow chart when opening/closing disc tray

5. Troubleshooting process for “No output for composite video” is shown as the following figure 3.3.2.6:

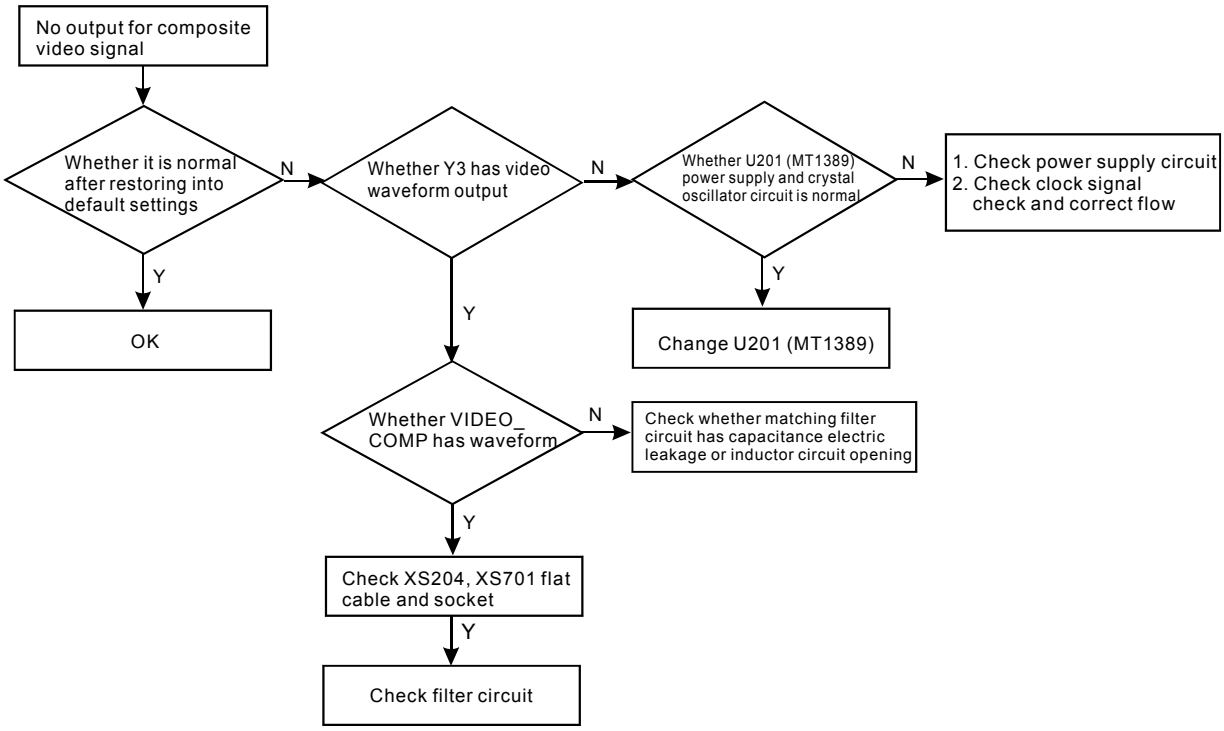

No output for composite video signal
Whether it is normal after restoring into default settings
N
Y
OK
Whether Y3 has video waveform output
N
Y
Whether U201 (MT1389) power supply and crystal oscillator circuit is normal
N
Y
1. Check power supply circuit
2. Check clock signal check and correct flow
Change U201 (MT1389)
Whether VIDEO_ COMP has waveform
N
Check whether matching filter circuit has capacitance electric leakage or inductor circuit opening
Y
Check XS204, XS701 flat cable and socket
Y
Check filter circuit

Figure 3.3.2.6 Flow chart of “No output for composite video”

6. Troubleshooting process for “On-screen-mosaic when playing” is shown as the following figure 3.3.2.7:

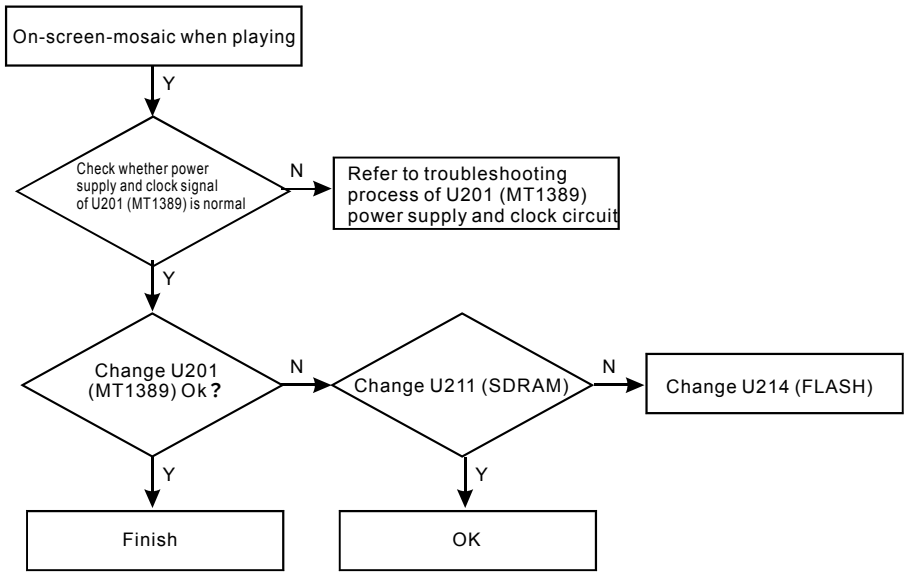


Figure 3.3.2.7 Flow chart of “On-screen-mosaic when playing”

7. Troubleshooting process for "No colour of picture" is shown as the following figure 3.3.2.8:

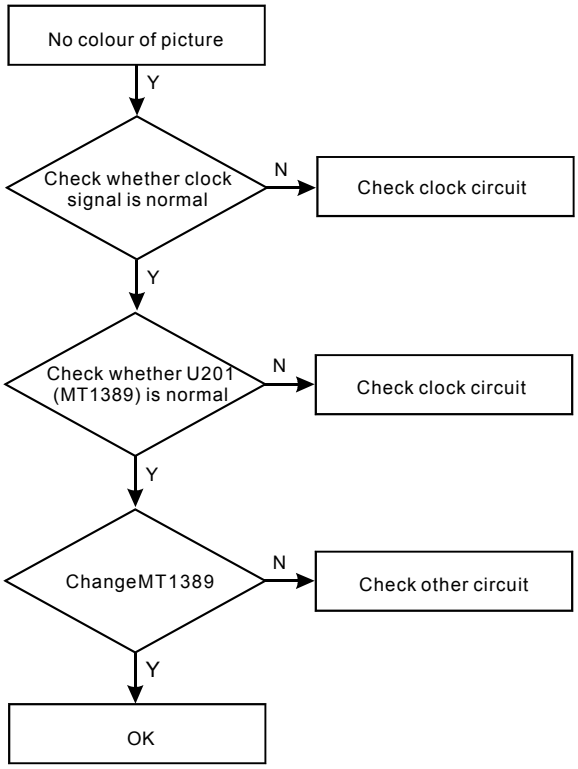


Figure 3.3.2.8 Flow chart of “No colour of picture”

8. Troubleshooting process for “5.1CH has no sound output” is shown in the following figure 3.3.2.9:

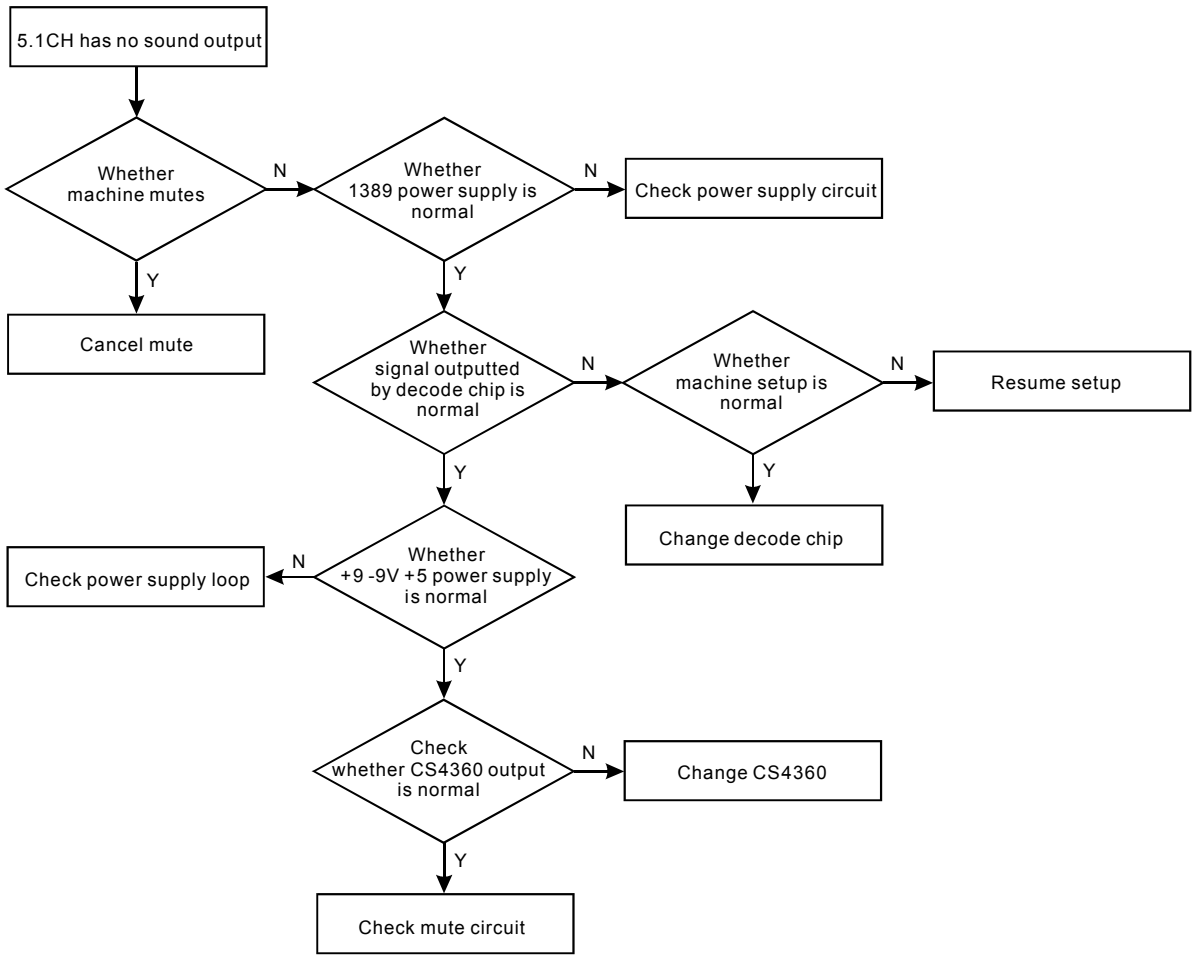


Figure 3.3.2.9 Troubleshooting flow chart for “5.1CH has no sound output”

9. Troubleshooting process for “Left channel has no output” is shown in the following figure 3.3.2.10:

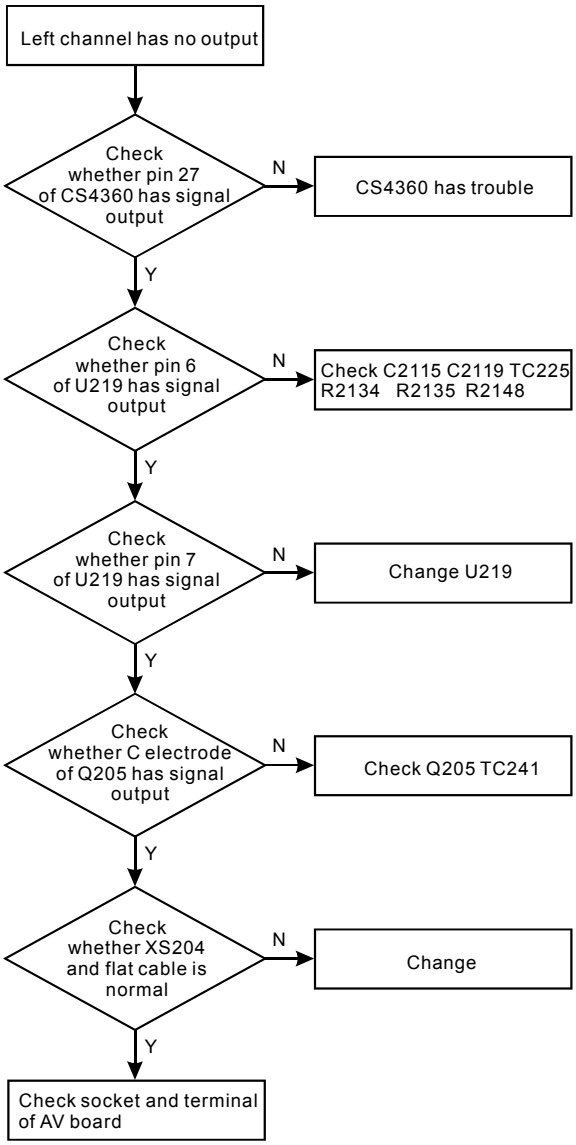


Figure 3.3.2.10 Troubleshooting flow chart for “Left channel has no output”

10. Troubleshooting process when voltage is on high or low side, shown as the following figure 3.3.2.11:

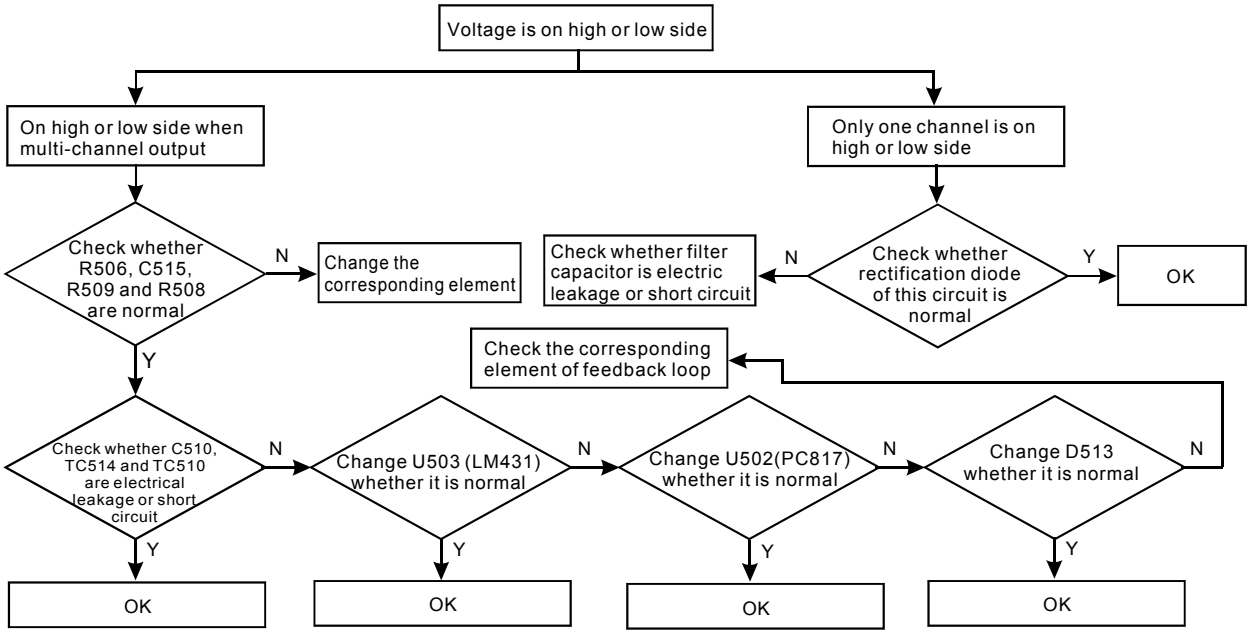


Figure 3.3.2.11 Troubleshooting flow chart for “Voltage is on high or low side”

11. Troubleshooting process for “Output power of power supply is not enough” is shown as the following figure 3.3.2.12:

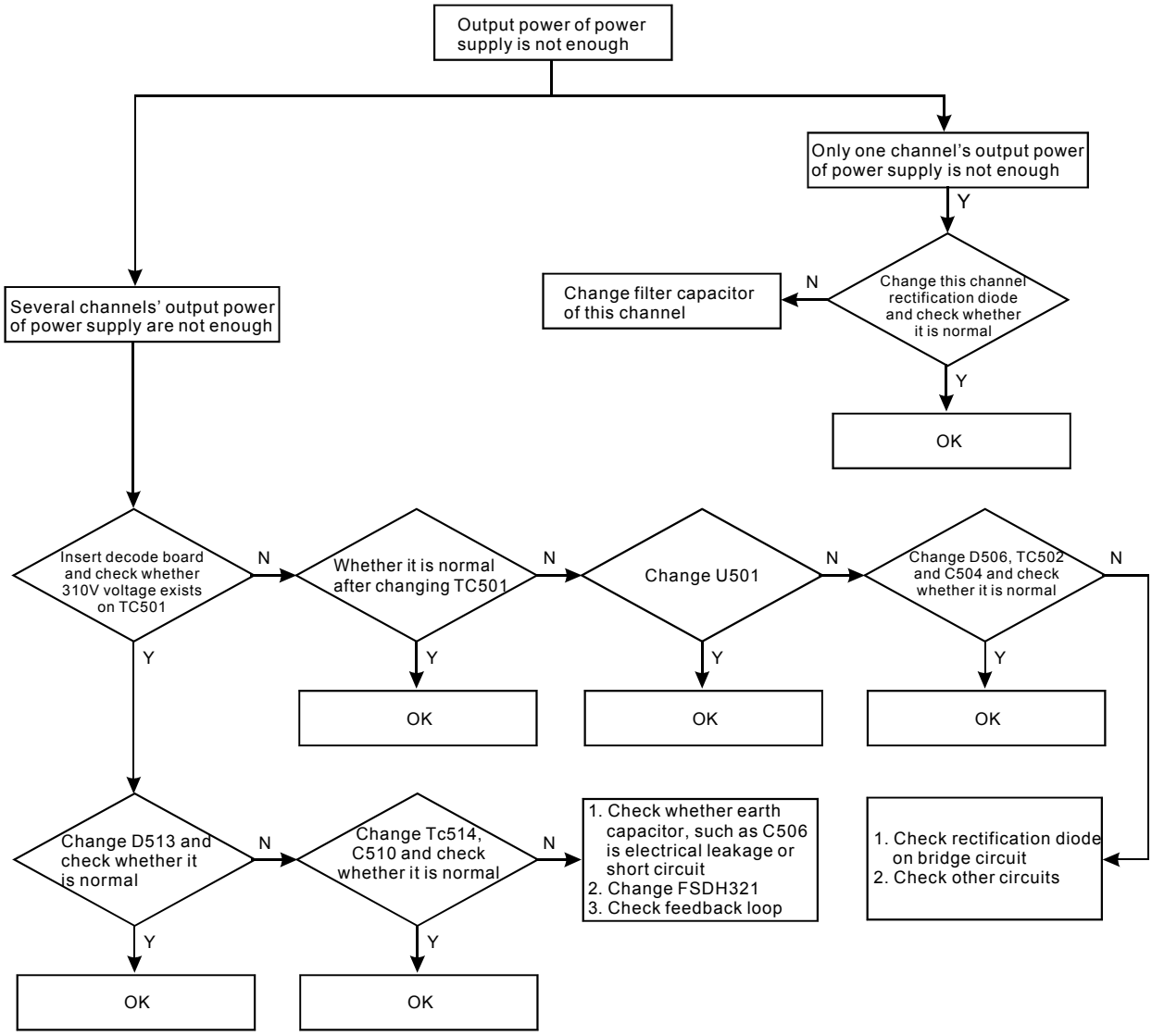

Output power of power supply is not enough
Only one channel's output power of power supply is not enough
Y
Change this channel rectification diode and check whether it is normal
N
Change filter capacitor of this channel
Y
OK
Several channels' output power of power supply are not enough
Insert decode board and check whether 310V voltage exists on TC501
N
Whether it is normal after changing TC501
N
Change U501
N
Change D506, TC502 and C504 and check whether it is normal
N
Y
OK
Y
OK
Y
OK
Change D513 and check whether it is normal
N
Change Tc514, C510 and check whether it is normal
N
1. Check whether earth capacitor, such as C506 is electrical leakage or short circuit
2. Change FSDH321
3. Check feedback loop
1. Check rectification diode on bridge circuit
2. Check other circuits
Y
OK
Y
OK

Figure 3.3.2.12 Troubleshooting flow chart for “Output power of power supply is not enough”

12. Troubleshooting process for "No function for buttons" is shown as the figure 3.3.2.13:

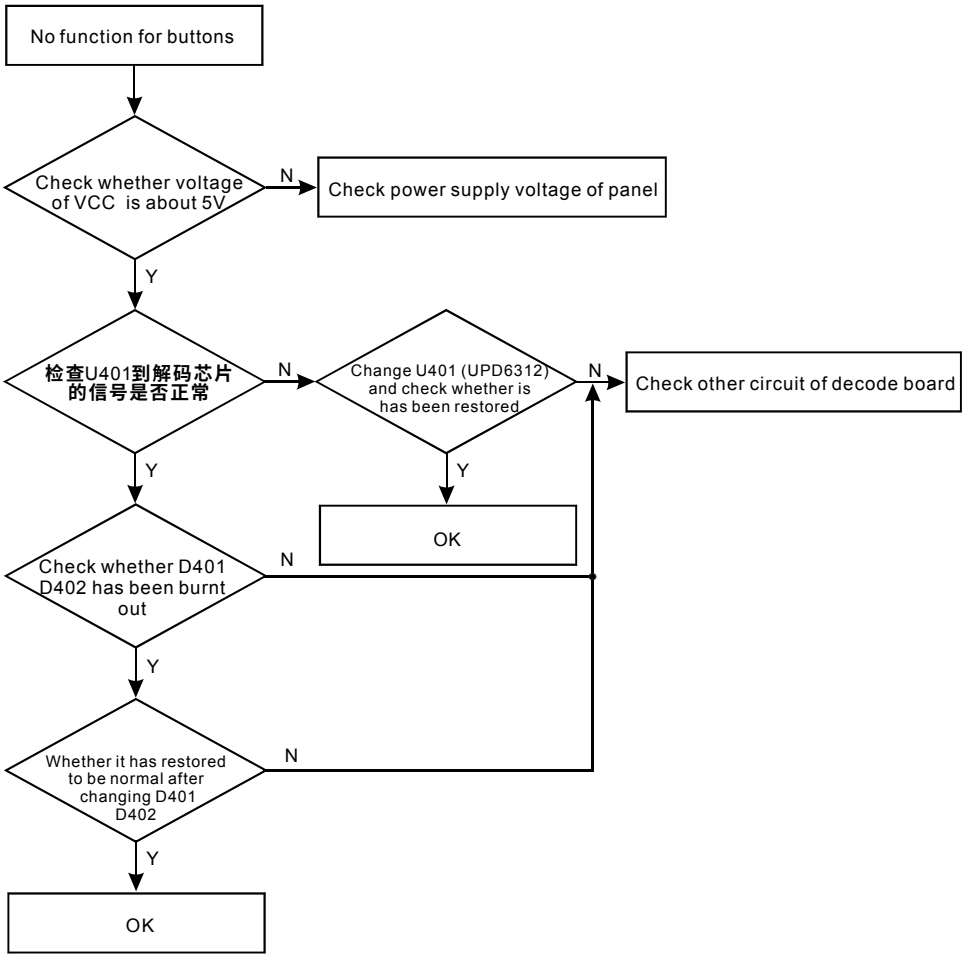


Figure 3.3.2.13 Troubleshooting flow chart for “No function for buttons”

13. Troubleshooting process for "No function for remote control" is shown as the figure 3.3.2.14:

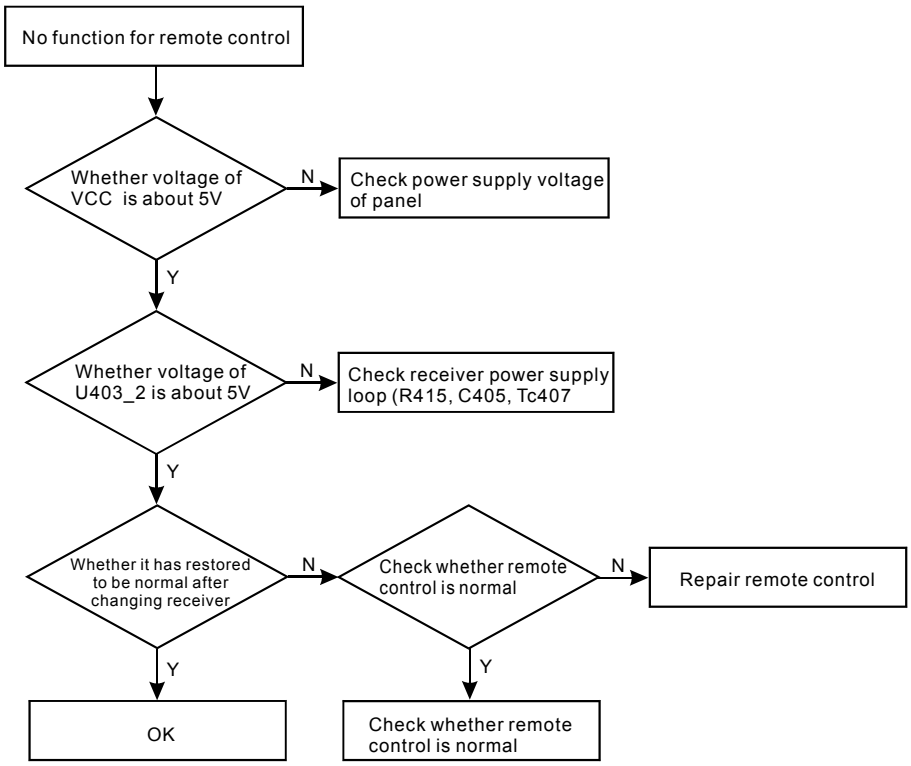


Figure 3.3.2.14 Troubleshooting flow chart for “No function for remote control”

14. Troubleshooting process for “No screen display” is shown as the figure 3.3.2.15:

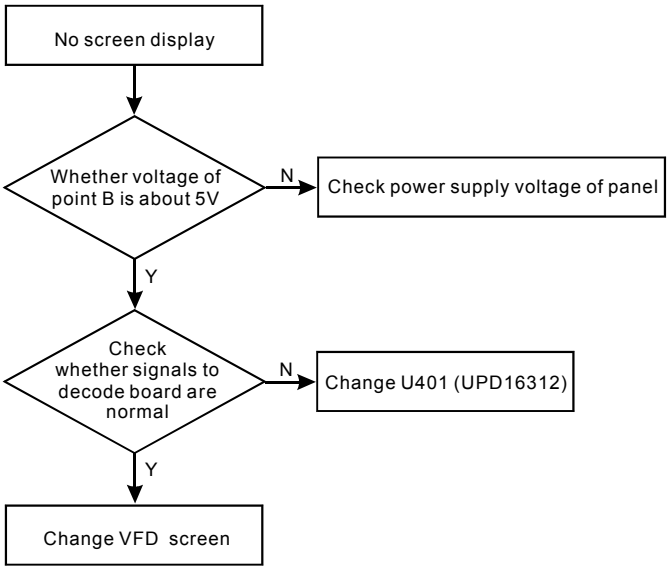
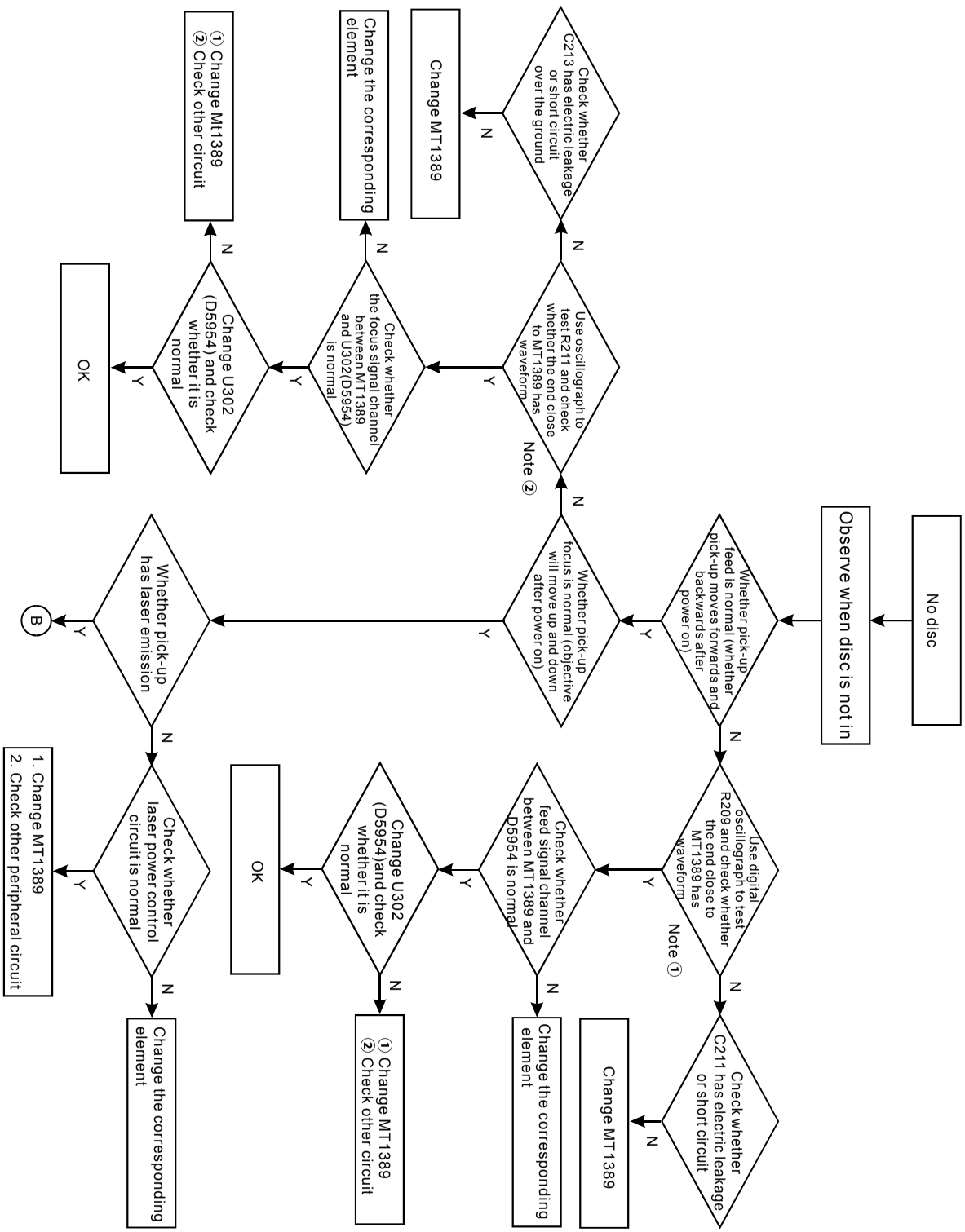


Figure 3.3.2.15 Troubleshooting flow chart for “No screen display”

15. The flow chart for "No disc reading" is shown as the following figure 3.3.2.16:


No disc
Observe when disc is not in
Whether pick-up feed is normal (whether pick-up moves forwards and backwards after power on)
Y
N
Use digital oscillograph to test R209 and check whether the end close to MT1389 has waveform
Note ①
Y
N
Check whether feed signal channel between MT1389 and D5954 is normal
Y
N
Change the corresponding element
Check whether C211 has electric leakage or short circuit
N
Change MT1389
Change U302 (D5954)and check whether it is normal
Y
N
① Change MT1389
② Check other circuit
OK
Whether pick-up focus is normal (objective will move up and down after power on)
Y
N
Use oscillograph to test R211 and check whether the end close to MT1389 has waveform
Note ②
Y
N
Check whether the focus signal channel between MT1389 and U302(D5954) is normal
Y
N
Change the corresponding element
Check whether C213 has electric leakage or short circuit over the ground
N
Change MT1389
Change U302 (D5954) and check whether it is normal
Y
N
① Change Mt1389
② Check other circuit
OK
Whether pick-up has laser emission
Y
B
N
Check whether laser power control circuit is normal
Y
N
1. Change MT1389
2. Check other peripheral circuit
Change the corresponding element

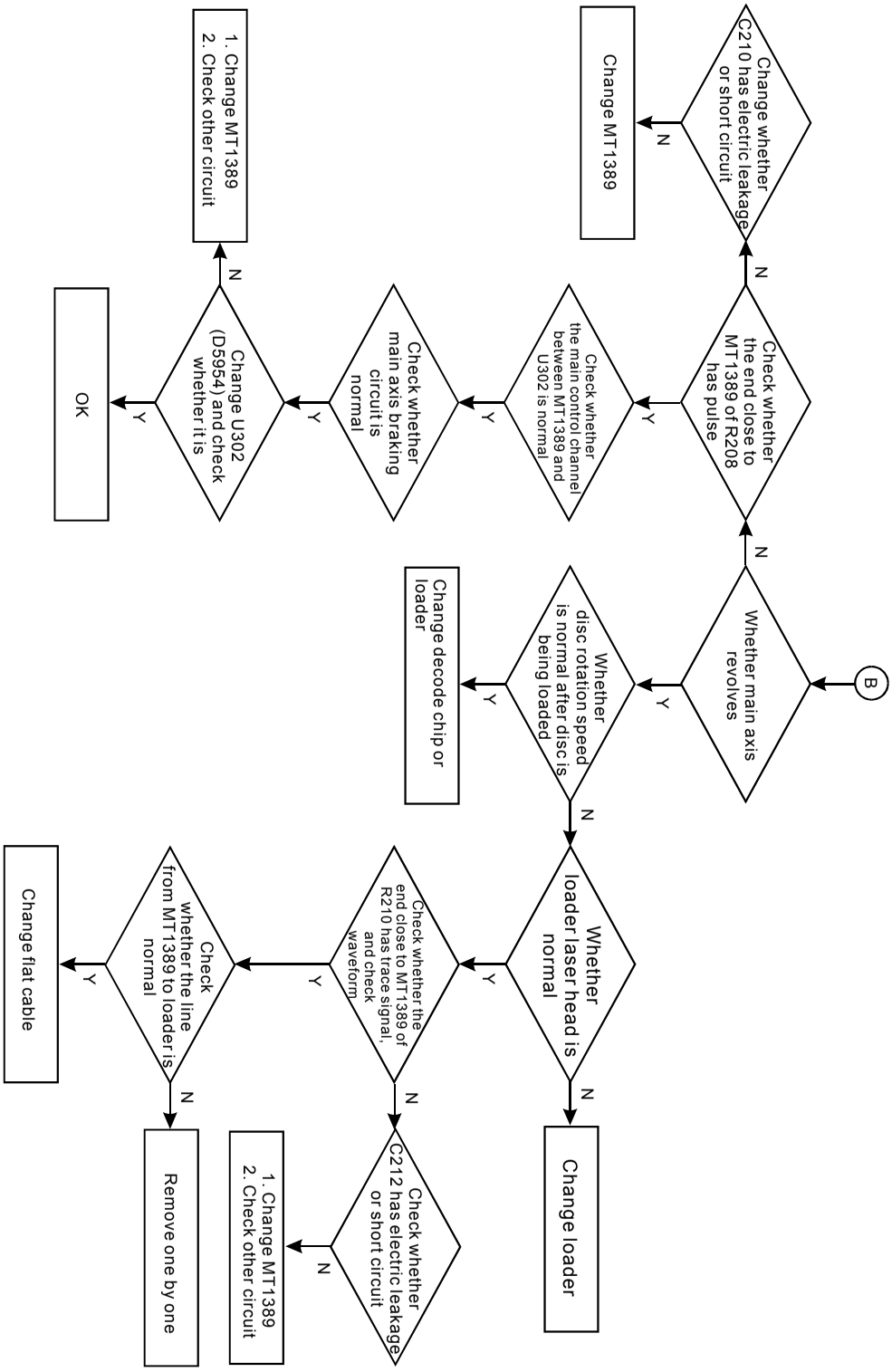


Figure 3.3.2.16 Troubleshooting flow chart for "Not read disc"

16. Troubleshooting process for “No voltage output” is shown as the figure 3.3.2.17:

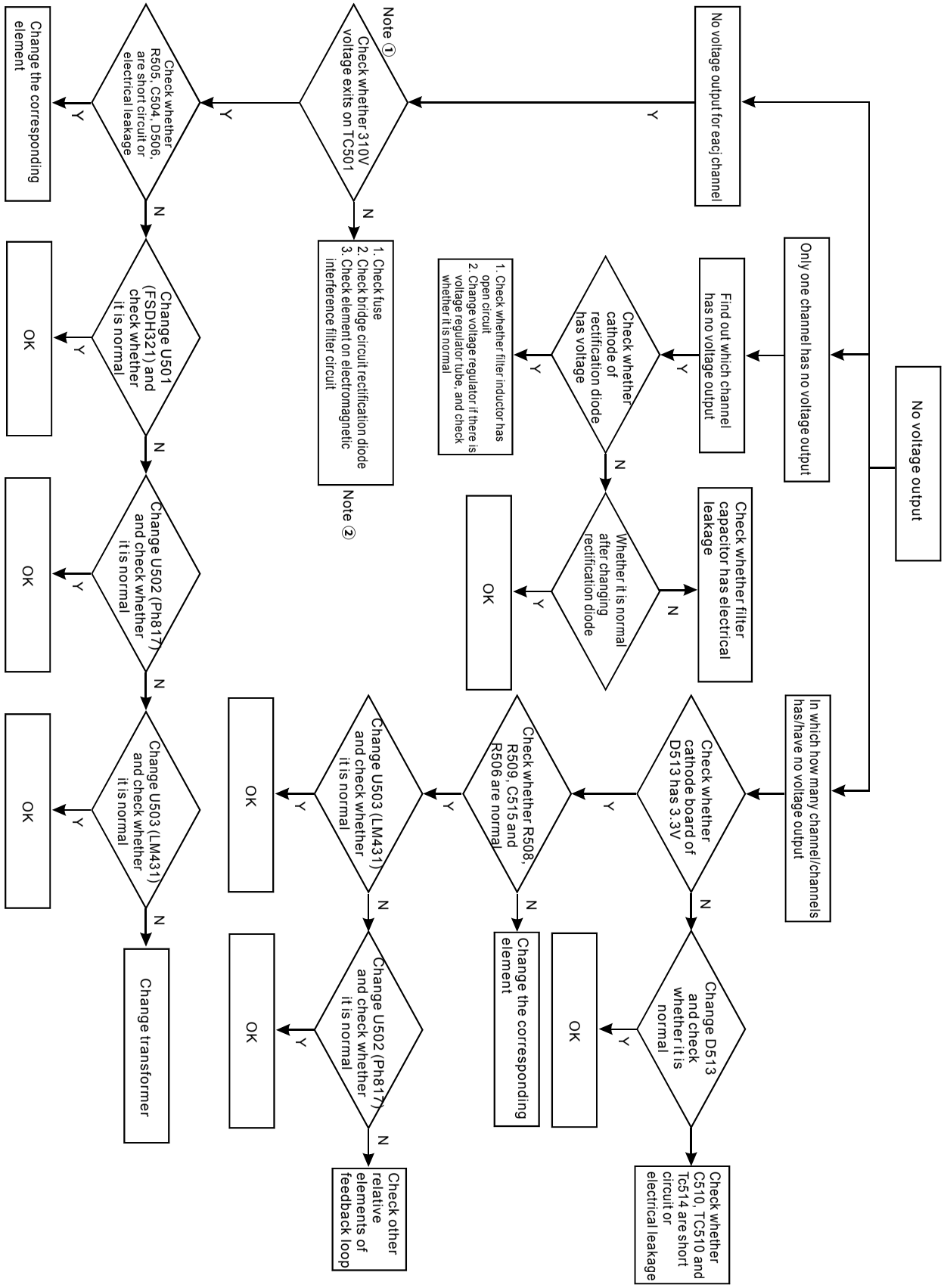
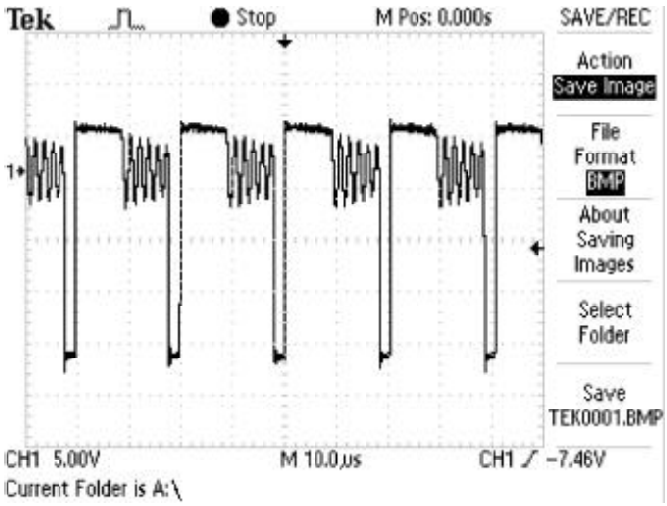

No voltage output
No voltage output for eacj channel
Only one channel has no voltage output
In which how many channel/channels has/have no voltage output
Find out which channel has no voltage output
Check whether cathode of rectification diode has voltage
Check whether cathode board of D513 has 3.3V
Check whether filter capacitor has electrical leakage
Whether it is normal after changing rectification diode
Check whether R508, R509, C515 and R506 are normal
Check whether 310V voltage exits on TC501
Check whether R505, C504, D506 are short circuit or electrical leakage
Change U501 (FSDH321) and check whether it is normal
Change U502 (Ph817) and check whether it is normal
Change U503 (LM431) and check whether it is normal
Change D513 and check whether it is normal
Change U503 (LM431) and check whether it is normal
Change U502 (Ph817) and check whether it is normal
1. Check whether filter inductor has open circuit
2. Change voltage regulator if there is voltage regulator tube, and check whether it is normal
1. Check fuse
2. Check bridge circuit rectification diode
3. Check element on electromagnetic interference filter circuit
Note ①
Note ②
Change the corresponding element
Change transformer
Check whether C510, TC510 and Tc514 are short circuit or electrical leakage
Check other relative elements of feedback loop
OK
Y
N

Figure 3.3.2.17 Troubleshooting flow chart for “No voltage output”

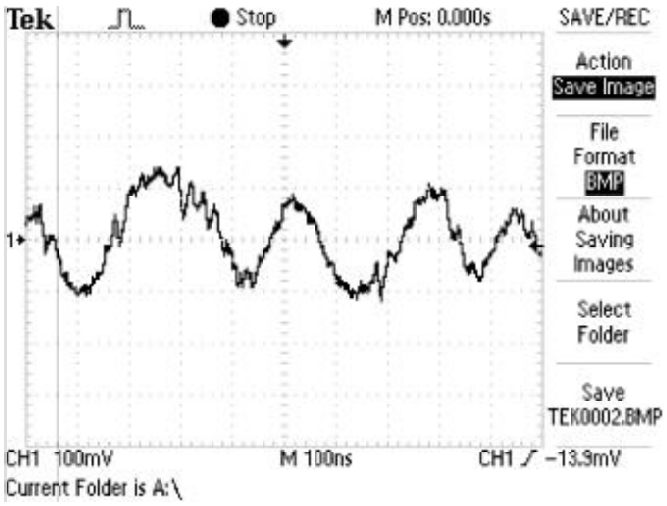
Section Four Waveform diagram

This section collects signal waveform diagram of audio, video and each unit circuit with the purpose to help servicing personnel to judge where trouble lies in accurately and quickly to improve servicing skills. For the difference of oscillograph's type, model and tuner, a certain difference may exist, so the servicing personnel are expected to pay more attention to check in daily operation.

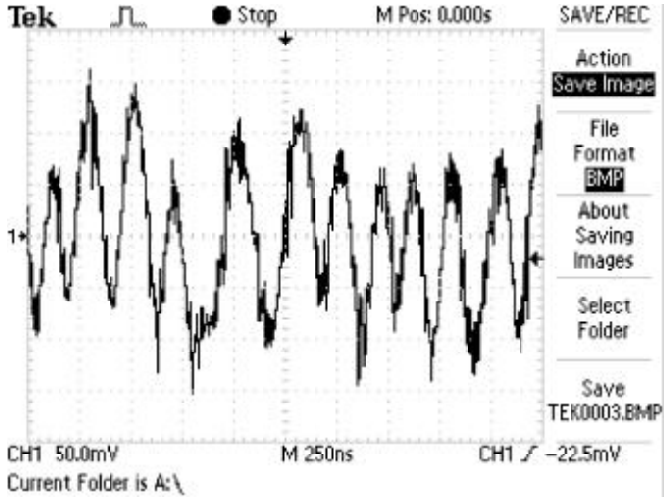
1. Waveform diagram for pulse DC of power board D513 anode



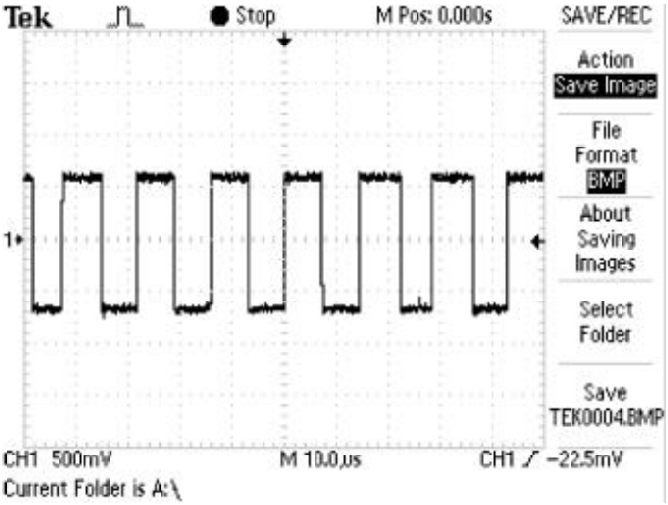
2. RFO signal waveform diagram of pin 8 of Xs301



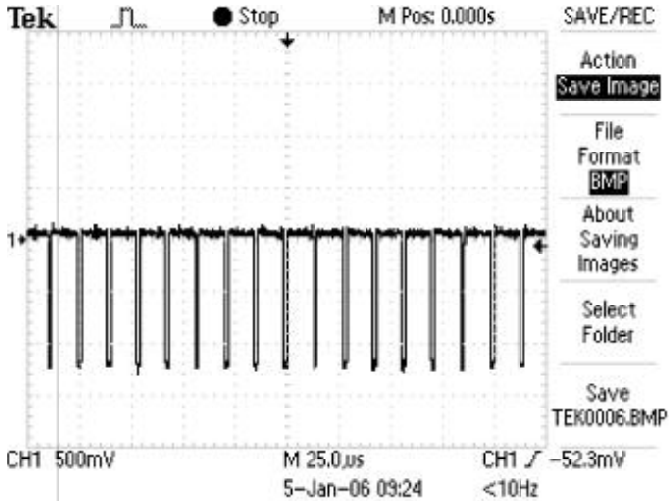
3. A signal waveform diagram of pin 9 of Xs301(B、C、D、E、F)



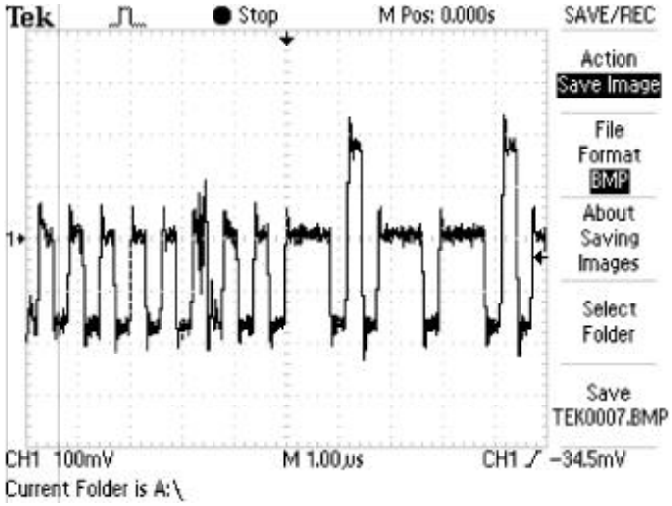
4. DMO signal (when there is main axis rotation) waveform diagram of pin 37 of U201 (MT1389)



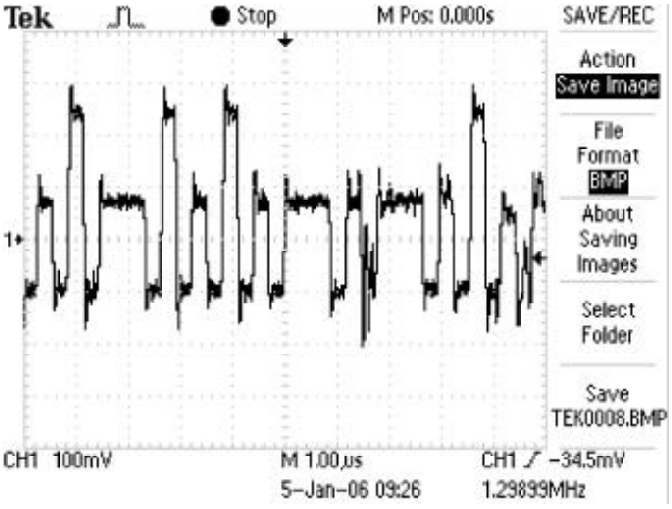
5. FMO signal (when there is feed) waveform diagram of pin 38 of U201 (MT1389)



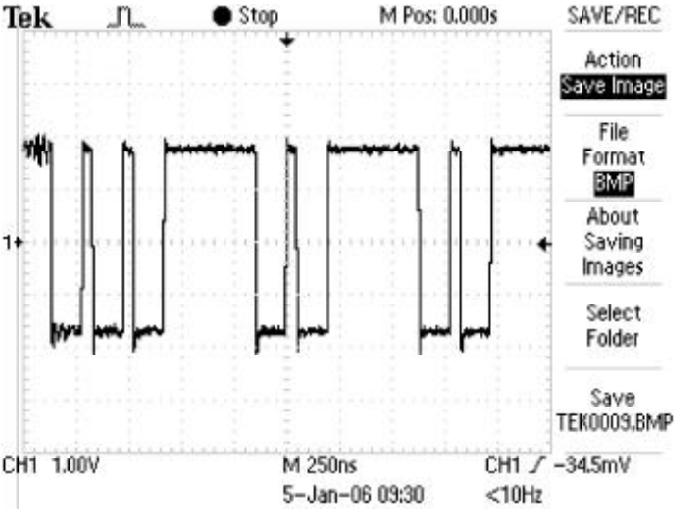
6. TRO signal (when there is trace) waveform diagram of pin 41 of U201 (MT1389)



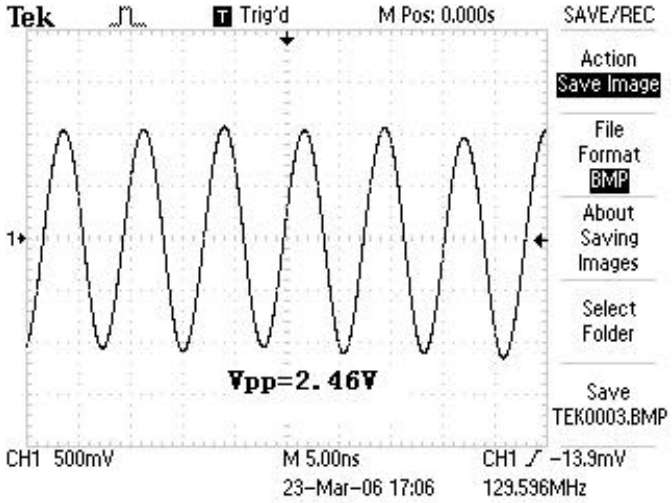
7. FOO signal (when there is focus) waveform diagram of pin 42 of U201 (MT1389)



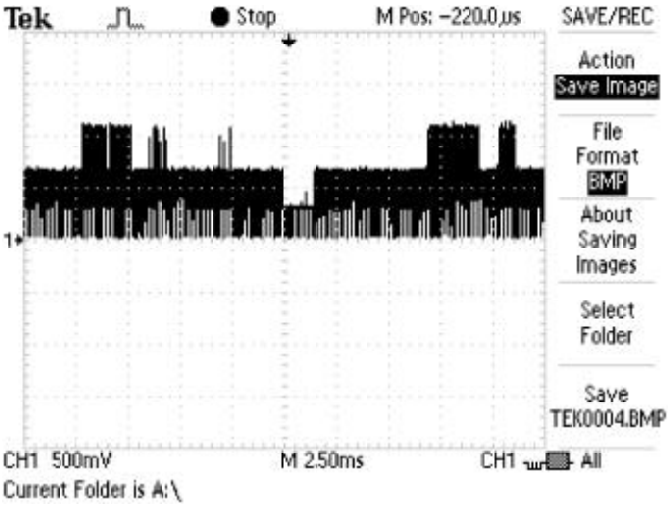
8. Waveform diagram of pin 29 (when no disc in) of U214 (FLASH)



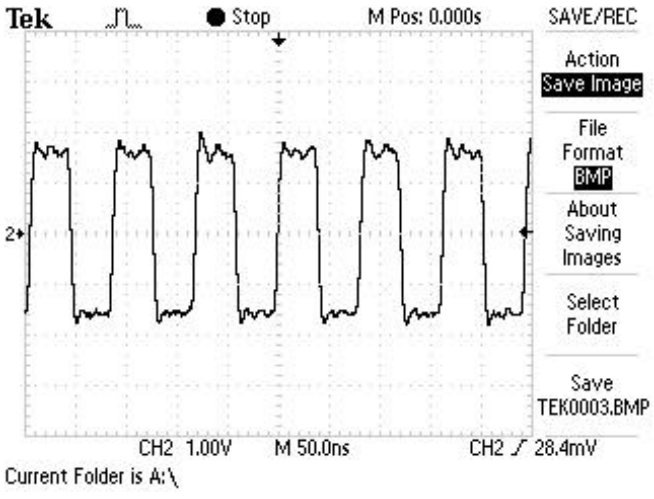
9. Waveform diagram of pin 38of U211 (SDRAM)



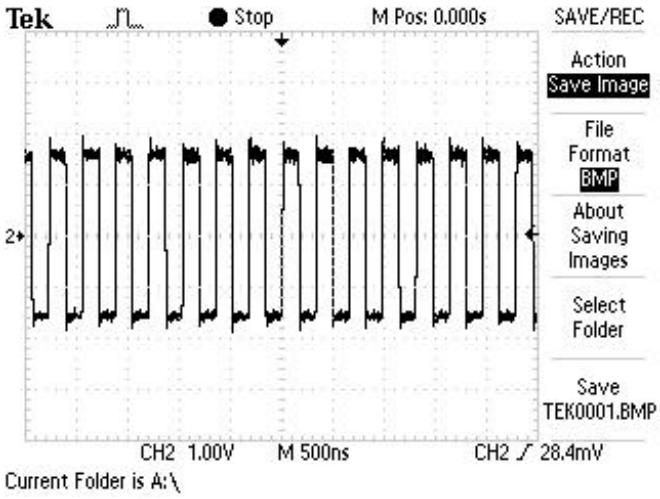
10. Video signal waveform diagram



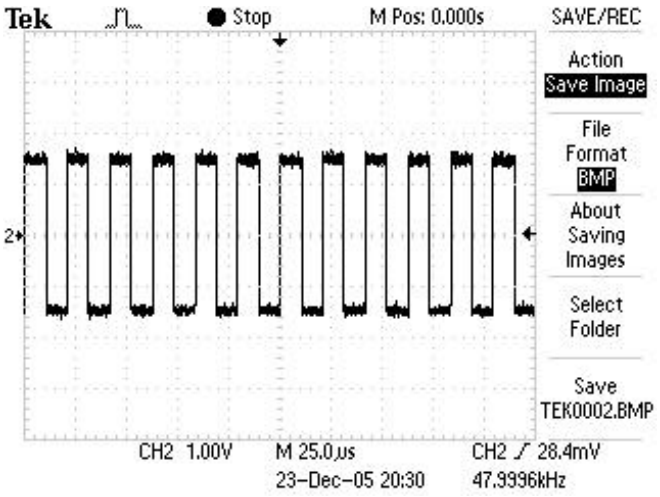
11. ACLK (12.2878MHZ): waveform diagram for external clock signal



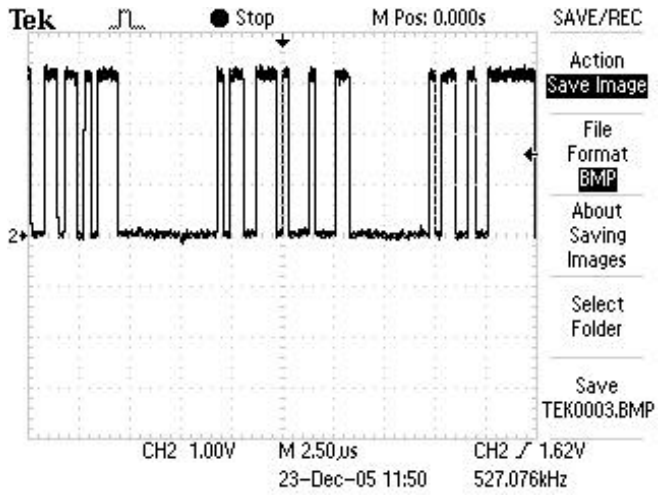
12. ABCK (3.07195MHZ): waveform diagram for bit clock signal



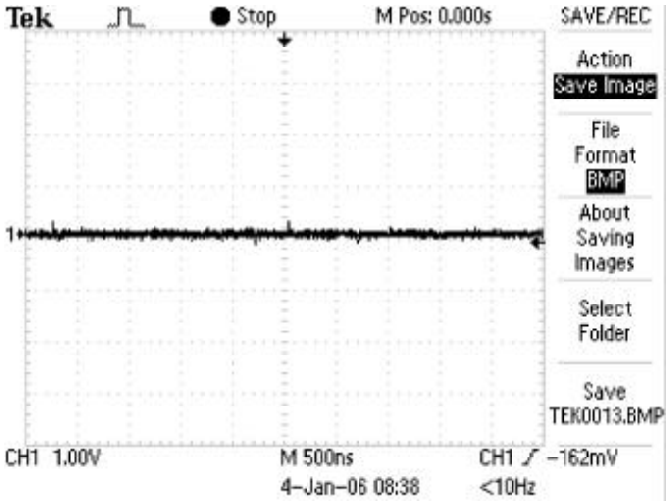
13. ALRCK (48KHZ): waveform diagram for left/right channel clock signal



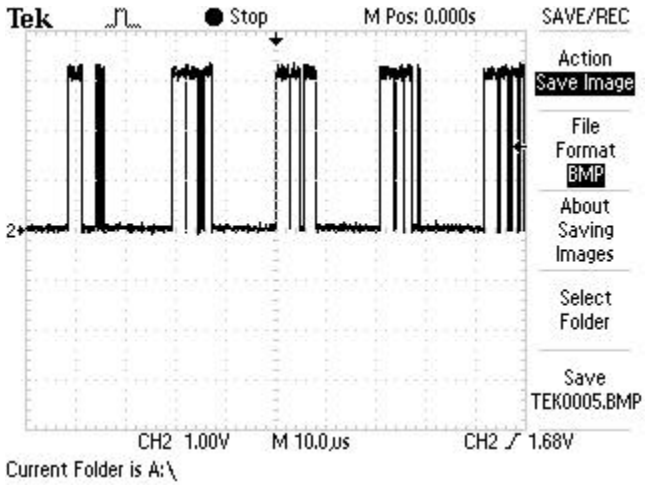
14. SDATAO: waveform diagram for mixed left/right channel digital signal



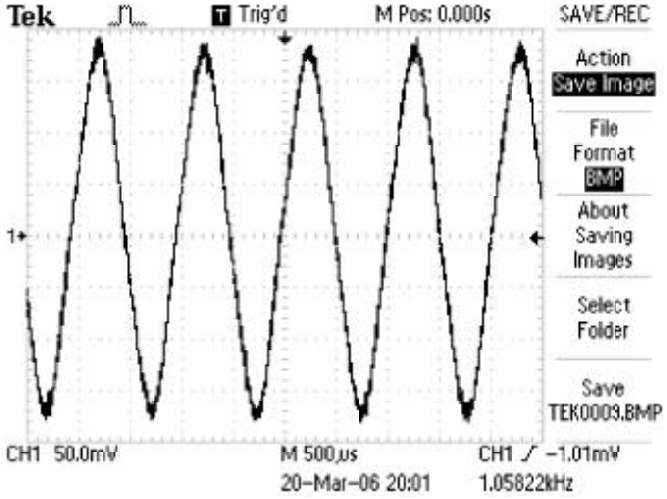
15. SDATA1: waveform diagram for surround left/right channel digital signal (now the disc being played is 2.1CH, and this signal has no output; if 5.1CH, the form is the same with that of SDATA0)



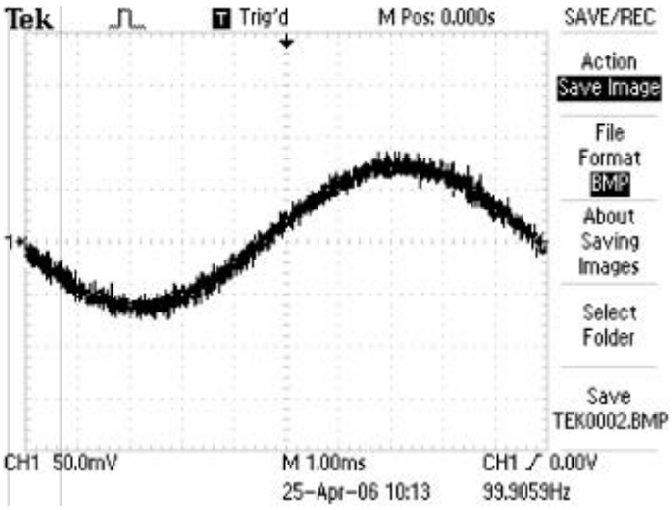
16. SDATA2: waveform diagram for centre subwoofer digital signal



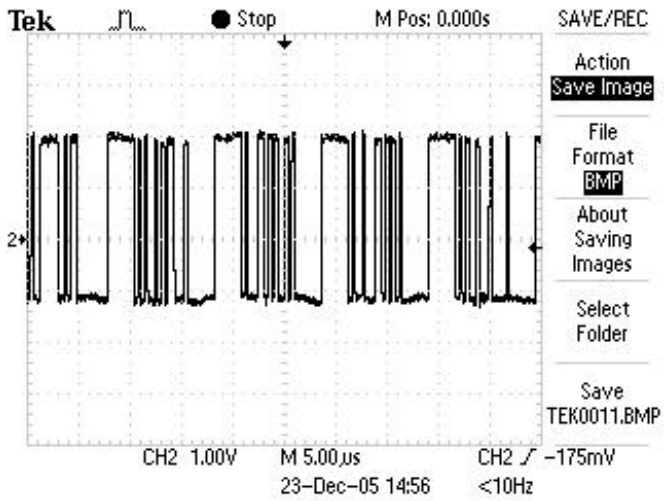
17. 1KHZ analog audio signal output waveform diagram (it is suggested to use test disc, if not, the tested waveform will change at any time to affect judgment. Other waveform is accordant except subwoofer).



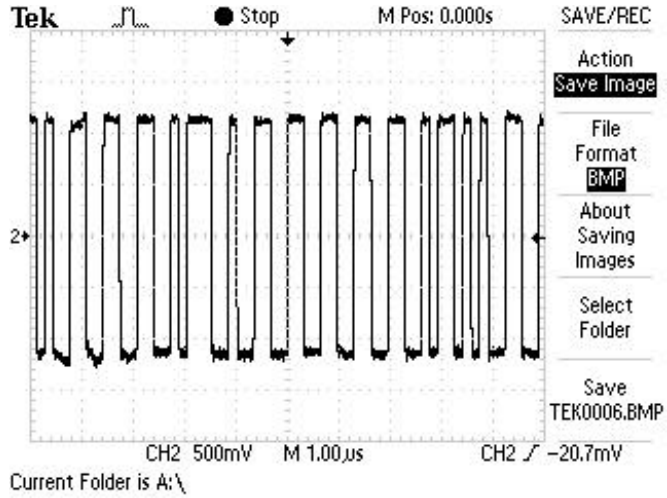
18. LEF#: waveform diagram for subwoofer channel analog signal



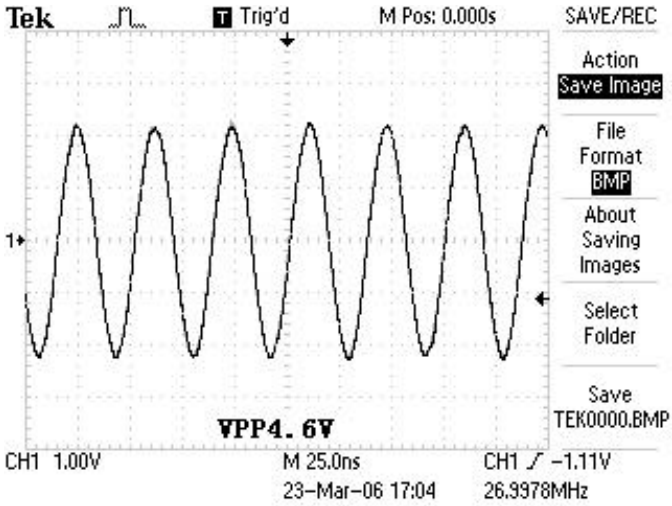
19. AMDAT: waveform diagram for microphone signal after 5340 A/D conversion



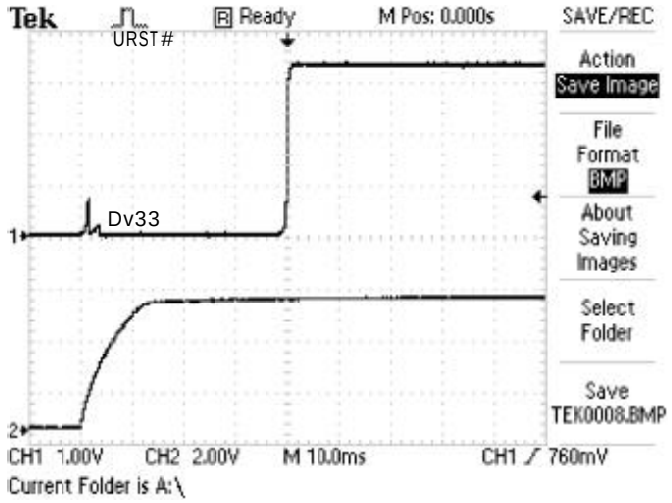
20. SPDIF: waveform diagram for optical/coaxial digital audio signal



21. 27M clock signal waveform diagram



22. Reset circuit waveform diagram



Section Five Function Introduction to IC

3.5.1 function introduction to MT1389

1. MT1389 (U201) adopts LQFP pin 256 casing and 3.3V/1.8V dual voltage working mode, which is a good performance large-scale CDROM front-end processing CMOS integrated circuit, and CD/VCD/DVD player special-used single chip. It includes focus servo error magnification, trace servo error magnification and horizontal output servo control. The main function are narrated as follows:

(1) The main function of front-end RF small signal processing is to process and amplify signals A, B, C, D, E and F transmitted from pick-up, and automatically adjust laser output power, meanwhile fulfil the identification of VCD disc and DVD disc.

(2) Digital servo processing may produce focus, trace, feed, main axis servo control signal processing and digital signal processing to realize modulating EFM/EFM+ of Therefore signal.

(3) MPEG1/MPEG2/MPEG4/JPEG Video decoder. This chip can decode VCD, DVD, MPEG 4 network video, compatible with “network movie” disc, and also can read JPEG picture to fulfil digital album playback.

(4) In audio aspect, AC-3/DTS dual decoding, actively read MP3, compatible with DVD Audio decode, to reach high resolution sound quality restore 1000 times higher than that of CD.

(5) By using the built-in 8032 micro-processer of chip, MT1389 may also fulfil the control of the player system to simplify circuit design greatly.

(6) Deal with data transferred from tuner and control the tuner.

2. Pin function of MT1389 is shown as the following table:

Pin	Name	Function	Data direction	DC voltage	Remark
1	AGND	Analog		0	
2	DVDA	DVD-RF high frequency AC coupling signal A	I	1.72	Signals A, B, C and D from loader are coupled by capacitor C201, C202, C203 and respectively
3	DVDB	DVD-RF high frequency AC coupling signal B	I	1.72	
4	DVDC	DVD-RF high frequency AC coupling signal C	I	1.72	
5	DVDD	DVD-RF high frequency AC coupling signal D	I	1.72	
6	DVDRFIP	DVD-RF high frequency AC coupling signal RFIP input	I	1.2	unused

7	DVDRFIN	DVD-RF high frequency AC coupling signal RFIN input	I	1.38	
8	MA	DVD-RAM main beam RF DC signal input A	I	2	Signals A, B, C and D from loader are coupled by resistor R201, R202, R203 and R204 respectively
9	MB	DVD-RAM main beam RF DC signal input B	I	2	
10	MC	DVD-RAM main beam RF DC signal input C	I	2	
11	MD	DVD-RAM main beam RF DC signal input D	I	2	
12	SA	DVD-RAM assistant beam RF DC signal input A	I	1.4	unnsed
13	SB	DVD-RAM assistant beam RF DC signal input B	I	1.33	
14	SC	DVD-RAM assistant beam RF DC signal input C	I	1.35	
15	SD	DVD-RAM assistant beam RF DC signal input D	I	1.31	
16	CDFON	CD focus error inverted input	I	1.33	
17	CDFOP	CD focus error onoinverted input	I	1.3	
18	TNI	3 beam assistant PD signal interted input	I	2	E, F signal input directly
19	TPI	4 beam assistant PD signal noninverted input	I	2	
20	MDI1	Laser power monitoring input 1	I	0	
21	MDI2	Laser power monitoring input 2	I	0	
22	LDO2	Laser power output 2	O	3.18	
23	LDO1	Laser power output 1	O	3.18	
24	SVDD3	Servo 3.3V power supply		3.2	
25	CSO/RFOP	Main servo signal output/RF noninverted output	O	1.3	R2165 is unused, so these two pins are unused.
26	RFLVL/RFON	RF level output/RF inverted output	O	1.33	
27	SGND	Servo ground		0	
28	V2REFO	Reference voltage 2.8V	O	2.74	
29	V20	Reference voltage 2.0V	O	2.18	
30	VREFO	Reference voltage1.4V	O	1.5	
31	FEO	Focus error signal output	O	1.5	R2166 is unused
32	TEO	Trace error signal output	O	1.16	
33	TEZISLV	Trace zero passage error input	I	1.32	Joint welding with capacitor C207 connected with this position will cause disc not reading
34	OP_OUT	Sensing signal magnifying output	O	2.55	Input/output of main axis

35	OP_INN	Sensing signal inverted output	I	2	braking circuit
36	OP_INP	Sensing signal noninverted output	I	1.74	
37	DMO	Main axis control signal output	O	1.37	
38	FMO	Feed control signal output	O	1.38	
39	TROPEN PWM	Close signal output	O	0	
40	PWMOUT1/ADIN9	the first path PWM signal output/AD universal input	I	1.38	unused
41	TRO	Trace control signal output	O	1.38	
42	FOO	Focus control signal output	O	1.38	
43	USB_VSS	USB ground		0	
44	USBP	USB data	I/O	0	unused
45	USBM	USB data	I/O	0	
46	USB_VDD3	USB 3.3V power supply		3.2	
47	FG/ADIN8	Sensing signal input/AD universal input	I	2.69	
48	TDI/ADIN4	Open-to-position checking signal input/AD universal input	I	3.2	
49	TMS/ADIN5	Open-to-position checking signal input/AD universal input	I	0	
50	TCK/ADIN6	BA5954 signal output/AD universal input	O	0	
51	TDO/ADIN7	Open signal output/AD universal input	O	0	
52	DVDD18	Digital 1.8V power supply		1.8	
53	IOA2	Microcontroller address bit 2	O	1.96	FLASH address signal
54	IOA3	Microcontroller address bit 3	O	1.98	
55	IOA4	Microcontroller address bit 4	O	1.96	
56	IOA5	Microcontroller address bit 5	O	1.69	
57	IOA6	Microcontroller address bit 6	O	3.23	
58	IOA7	Microcontroller address bit 7	O	3.23	
59	HIGHA0	Microcontroller address bit 0	O	1.01	
60	IOA18	Microcontroller address bit 18	O	0.05	
61	IOA19	Microcontroller address bit 19	O	0	
62	DVSS	Digital		0	
63	APLLCAP	Analog phase-locked loop external capacitor		1.8	
64	APLLVSS	Analog phase-locked loop		0	

65	APLLVDD3	Analog phase-locked loop 3.3V power supply		3.1	
66	IOWR	FLASH read-write control signal	O	3.23	output PWR# and change into DWR# signal to control FLASH through 0 ohm resistor R297
67	A16	FLASH address bit 16	O	1.3	FLASH address signal
68	HIGHA7	Microcontroller address bit 7	O	1.18	
69	HIGHA6	Microcontroller address bit 6	O	1.99	
70	HIGHA5	Microcontroller address bit 5	O	2.9	
71	HIGHA4	Microcontroller address bit 4	O	2	
72	HIGHA3	Microcontroller address bit 3	O	1.11	FLASH address signal
73	DVDD3	Digital 3.3V power supply		3.24	
74	HIGHA2	Microcontroller address bit 2	O	1.81	
75	HIGHA1	Microcontroller address bit 1	O	1.55	FLASH address signal
76	IOA20	Microcontroller address bit 20	O	0	
77	IOCS	FLASH chip selection	O	0	Output PCE# signal and change into DCE# signal to control FLASH through 0 ohm resistor R298
78	IOA1	Microcontroller address bit 1	O	2.03	FLASH address signal
79	IOOE	FLASH output enable	O	0	Output PRD# signal and change into DRD# signal to control FLASH output through 0 ohm resistor R299
80	DVDD3	Power supply		3.23	
81	AD0	Microcontroller address/data bit 0	I/O	1.32	FLASH data signal
82	AD1	Microcontroller address/data bit 1	I/O	1.52	
83	AD2	Microcontroller address/data bit 2	I/O	1.16	
84	AD3	Microcontroller address/data bit 3	I/O	0.9	
85	DVSS	Ground		0	
86	AD4	Microcontroller address/data bit 4	I/O	1.57	FLASH data signal
87	AD5	Microcontroller address/data bit 5	I/O	1.57	
88	AD6	Microcontroller address/data bit 6	I/O	1.57	
89	IOA21/ADIN0	Microcontroller address bit 21/AD universal input	O	0.03	FLASH address signal

90	ALE	Microcontroller address enable	O	1.18	unused
91	AD7	Microcontroller address/data bit 7	I/O	1.6	FLASH data signal
92	A17	FLASH address bit 17	O	0	FLASH address signal
93	IOA0	Microcontroller address bit 0	O	2.04	
94	DVSS	Digital		0	
95	UWR	Microcontroller write operation		3.22	unused
96	URD	Microcontroller read operation		3.26	
97	DVDD18	Digital 1.8V power supply		1.92	
98	UP1_2	Microcontroller port		0	unused
99	UP1_3	Microcontroller port	O	5.15	Panel communication-used clock
100	UP1_4	Microcontroller port	I/O	5.2	Panel communication-used data
101	UP1_5	Microcontroller port	O	5.2	Panel communication-enable
102	UP1_6	Microcontroller port	O	0.3	I2C clock
103	UP1_7	Microcontroller port	I/O	3.22	I2C data
104	UP3_0	Microcontroller port	O	0	Tuning signal after being managed from SAA6588
105	UP3_1	Microcontroller port	O	0.68	
106	UP3_4	Microcontroller port	I/O	3.8	Serial communication port
107	UP3_5	Microcontroller port	I/O	3.23	Serial communication port
108	DVDD3	Power supply		3.24	
109	ICE	Microcontroller correction mode enable		0	Ground through 1K resistor R213
110	PRST	Reset input	I	3.3	
111	IR	Remote control signal input	I	5.03	
112	INT0	Microcontroller interrupt 0	I	3.6	unused
113	DQM0	DRAM input/output screen-shielded signal	O	2.2	
114	DQS0	DRAM input/output screen-shielded signal	O	3.22	
115	RD7	DRAM data	I/O	0.9	SDRAM data line
116	DVSS	Ground		0	
117	RD6	DRAM data	I/O	0.4	SDRAM data line
118	RD5	DRAM data	I/O	0.85	

119	DVSS	Ground		0.02	
120	RD4	DRAM data	I/O	1.62	SDRAM data line
121	RD3	DRAM data	I/O	1	
122	DVDD18	Digital 1.8V power supply		1.9	
123	RD2	DRAM data	I/O	1.15	SDRAM data line
124	RD1	DRAM data	I/O	0.92	
125	RD0	DRAM data	I/O	0.92	
126	RD15	DRAM data	I/O	0.66	
127	DVDD3	Digital 3.3V power supply		3.21	
128	RD14	DRAM data	I/O	1.2	SDRAM data line
129	RD13	DRAM data	I/O	1.2	
130	RD12	DRAM data	I/O	1.42	
131	RD11	DRAM data	I/O	0.85	
132	RD10	DRAM data	I/O	0.87	
133	RD9	DRAM data	I/O	0.98	SDRAM data line
134	DVSS	Ground		0.01	
135	RD8	DRAM data	I/O	0.67	SDRAM data line
136	DQS1	DRAM input/output screen-shielded signal	O	3.24	
137	DQM1	DRAM input/output screen-shielded signal	O	2.6	
138	RWE	DRAM write enable	O	3.17	Output WE# signal and change into DWE# to control the write of SDRAM through 33 ohm resistor
139	CAS	DRAM line address selection	O	3.11	Output RAS# and change into DCAS# to control line address selection of SDRAM through 33 ohm resistor R267
140	RAS	DRAM row address selection	O	3.15	Output RAS# and change into DRAS# to control row address selection of SDRAM through 33 ohm resistor R266
141	DVDD3	Digital 3.3V power supply		3.22	

142	RCS	DRAM chip selection	O	2.7	Output CS# and change into DCS# to control chip selection of SDRAM through 33 ohm resistor 265
143	BA0	DRAM section address 0	O	1.75	
144	DVSS	Ground		0	
145	BA1	DRAM section address 1	O	1.95	SDRAM address line
146	RA10	DRAM address	O	0.04	
147	RA0	DRAM address	O	0.4	
148	DVSS	Ground		0	
149	RA1	DRAM address	O	2.2	SDRAM address line
150	RA2	DRAM address	O	2.25	
151	RA3	DRAM address	O	1.57	
152	DVDD18	Digital 1.8V power supply		1.91	
153	RVREF/ADIN3	Reference voltage/AD universal input	I	0.01	unused
154	RCLKB	DRAM clock	O	0.01	
155	DVDD3	Digital 3.3V power supply		3.21	
156	RCLK	DRAM clock	O	1.66	
157	CKE	DRAM clock enable	O	1.2	
158	RA11	DRAM address	O	0.03	SDRAM address line
159	RA9	DRAM address	O	0.07	
160	RA8	DRAM address	O	0.04	
161	DVSS	Digital		0	
162	RA7	DRAM address	O	1.4	SDRAM address line
163	DVSS	Digital		0	
164	RA6	DRAM address	O	1.44	SDRAM address line
165	RA5	DRAM address	O	1.74	
166	RA4	DRAM address	O	1.63	
167	DVDD3	Digital 3.3V power supply	O	3.21	
168	RD13/ASDATA5	DRAM data/audio serial data	I	5.04/3.03	Digital potentiometer input (J3)
169	RD30	DRAM data	I/O	0.01	Digital potentiometer inpout (J4)

170	RD29	DRAM data	O	0.01	CD4052 select signal (AUNIN SL0)
171	RD28	DRAM data		0.01	CD4052 select signal (AUNIN SL1)
172	RD27	DRAM data		0.01	select signal of N4 74HCT125
173	DVDD18	Digital 1.8V power supply		1.91	
174	RD26	DRAM data	I/O	3.6	Output to N12. When headphone is not inserted, output 3.3V, and now the output to headphone from N12 has no waveform. When headphone is inserted, this pin outputs 0v, and now only the output to headphone and to left/right channel of AV board of N12 output have waveform, which is headphone select signal.
175	DVSS	Digital	I/O	0	Ground
176	RD25	DRAM data	I/O	3.6	Mute signal
177	RD24	DRAM data	I/O	1.68	
178	DQM3	DRAM input/output screen-shielded signal	O	0.04	Resistor R225 is unused, so this signal is unused in this model.
179	DQM2	DRAM input/output screen-shielded signal	O	0.01	Field sync signal
180	RD23	DRAM data	I/O	0.01	unused
181	RD22	DRAM data	I/O	0.01	Whether headphone is inserted to detecting signal
182	DVDD3	Digital 3.3V power supply		3.21	
183	RD21	DRAM data		0.02	When selecting tuning function, open power supply loop of tuner.
184	RD20	DRAM data		0.01	unused
185	RD19	DRAM data		0.02	control signal of tuner
186	RD18	DRAM data		0.02	tuner data

187	RD17	DRAM data		0.02	tuner clock
188	RD16	DRAM data		0.01	tuner data
189	DACVDDC	D/A conversion 3.3V power supply		3.5	
190	VREF	Reference voltage		1.32	
191	FS			1.32	
192	YUV0/CIN			1.8	unused
193	DACVSSC	D/A conversion		0.01	
194	YUV1/Y	Video signal YUV1 output/Y signal output	O	0.74	Supply Y signal for S-video
195	DACVDDB	D/A conversion 3.3V power supply		3.19	
196	YUV2/C	Video signal YUV2 output/C signal output	O	1.47	Supply C signal for S-video
197	DACVSSB	D/A conversion		0.01	
198	YUV3/CVBS	Video signal YUV3 output/CVBS signal output	O	0.74	Provide for video output port (VIDEO)
199	DACVDDA	D/A conversion 3.3V power supply		3.17	
200	YUV4/G	Video signal YUV4 output/G signal output	O	0.5	Supply Y1 signal for component video output port
201	DACVSSA	D/A conversion		0.01	
202	TUV5/B	Video signal YUV5 output/B signal output	O	0.01	Supply Pb signal for component video output port
203	YUV6/R	Video signal YUV6 output/R signal output	O	0	Supply Pr signal for component video output port
204	DVDD3	Digital 3.3V power supply		3.21	
205	VSYNC/ADIN1	Field sync signal output/AD universal input	O	0.04	Supply for SCART
206	YUV7/ASDATA5	Video signal YUV7 output/audio serial data		3.79	unused
207	HSYNC/ADIN2	Line sync signal output/AD universal input	O	0.2	Supply for SCART
208	SPMCLK		I	0.01	unused
209	SPDATA			0.14	unused
210	SPLRCK			3.78	unused
211	SPBCK/ASDATA5			3.86	unused
212	DVDD3	Digital 3.3V power supply		3.21	
213	ALRCK	Audio left/right channel clock	O	1.52	
214	ABCK	Audio bit clock	O	1.6	
215	ACLK	Audio DAC external clock	O	1.59	

216	DVSS	Digital		0	
217	ASDATA0	Audio serial data	O	0.01	
218	ASDATA1	Audio serial data	O	0.01	
219	ASDATA2	Audio serial data	O	0.01	
220	ASDATA3	Audio serial data		0.01	unused
221	DVDD18	Digital 1.8V power supply		1.93	
222	ASDATA4	Audio serial data	O	3.22	Give audio IC reset signal
223	DVSS	Digital		0.01	
224	MC_DATA	MIC digital audio input	I	1.24	
225	SPDIF	Digital audio signal output	O	1.61	
226	RFGND18	RF signal		0.01	
227	RFVDD18	RF signal 1.8V power supply		0.64	
228	XTALO	Clock output	O	3.18	
229	XTALI	Clock input	I	3.04	
230	JITFO	RF small signal output	O	0.04	
231	JITFN	RF small signal reversely amplifying input	I	2.23	
232	PLLVSS	Phase-locked loop		0.06	
233	IDACEXLP			3.22	
234	PLLVDD3	Phase-locked loop 3.3V power supply		0.01	
235	LPFON	Amplifier loop filter output	O	0.01	
236	LPFIP	Amplifier loop filter input	I	0.01	
237	LPFIN	Amplifier loop filter input	I	0.09	
238	LPFOP	Amplifier loop filter output	O	2.24	
239	ADCVDD3	D/A conversion 3.3V power supply		3.22	
240	S_VCM			0	
241	ADCVSS	D/A conversion		0	
242	S_VREFP			0	
243	S_VREFN			0.03	
244	RFVDD3	RF 3.3V power supply		3.22	
245	RFRPDC	DC RF error signal input		0.73	
246	RFRPAC	AC RF error signal input		1.37	
247	HRFZC	High frequency RF signal zero passage detect		3.2	

248	CRTPLP			1.53	
249	RFGND	RF ground		0.01	
250	CEQP			0.05	
251	CEQN			0.02	
252	OSP			1.68	
253	OSN			1.68	
254	RFGC			1.06	
255	IREF	Reference current		0.92	
256	AVDD3	Analog 3.3V power supply		3.22	

3.5.2 function introduction to FLASH

U214 (FLASH) 16Mbit memorizer, FLASH function pin are shown as follows:

Pin	Name	Function	Voltage (when no disc)	Data direction
1-9、16-25、48	AO-A19	20 bit address bus		I
11	WE	Write enable signal, low level is effective	3.23V	I
12	RESET	Reset, low level is effective	3.23V	I
10、13、14	NC	Blank pin		
15	RY/BY	Ready/system busy	3.23V	O
26	CE	Chip enable, low level effective	0V	I
27、46	VSS	Ground		
28	OE	Output enable signal , low level is effective	0V	I
29-3、6、38-44	DQ0-DQ14	15 bit data bus		O
37	VCC	5V power supply	+5V	
45	DQ15/A-1	Take word extend mode as data line, and bit extend mode as address line		I/O
47	BYTE	Select 8-bit or 16-bit output mode. High level is 16-bit output and low level is 8-bit output		I

3.5.3 function introduction to SDRAM

The function of SDRAM (U211) in the player is to save program taken out by Mt1389 from FLASH and information of picture and sound taken out from disc when the player is working to form damping, add the stability of information output and add anti-vibration of the player. The pin function and real voltage are shown

as the following table:

Pin	Name	Data direction	Function	Voltage (V)	Pin	Name	Data direction	Function	Voltage (V)
1	VDD		3.3V power supply	3.18	28	VSS		Ground	0.01
2	DQ0	I/O	Data bus	0.94	29	MA4	I	Address bus	1.65
3	VDDQ	I/O	3.3V power supply	3.19	30	MA5	I	Address bus	1.74
4	DQ1	I/O	Data bus	0.9	31	MA6	I	Address bus	1.49
5	DQ2	I/O	Data bus	1.3	32	MA7	I	Address bus	1.22
6	VSSQ		Ground	0	33	MA8	I	Address bus	0.05
7	DQ3	I/O	Data bus	1.2	34	MA9	I	Address bus	0.04
8	DQ4	I/O	Data bus	1.5	35	MA11	I	Address bus	0.04
9	VDDQ		3.3V power supply	3.18	36	NC		Blank pin	0.01
10	DQ5	I/O	Data bus	0.7	37	CKE	I	Clock enable signal	1.22
11	DQ6	I/O	Data bus	0.45	38	CLK	I	System clock input	1.68
12	VSSQ		Ground	0	39	UDQM	I	Data in/out screen-shielded signal	2.42
13	DQ7	I/O	Data bus	0.8	40	NC		Blank pin	0.01
14	VDD		3.3V power supply	3.14	41	VSS		Ground	0.01
15	LDQM	I	Data in/out screen-shielded signal	2.46	42	DQ8	I/O	Data bus	0.6
16	WE	I	Write control signal	3.17	43	VDDQ		3.3V power supply	3.19
17	CAS	I	Line address gating signal	3.01	44	DQ9	I/O	Data bus	0.91
18	RAS	I	Row address gating signal	3.13	45	DQ10	I/O	Data bus	0.8
19	CS	I	Chip selection signal	2.95	46	VSSQ		Ground	0.01
20	SD-BS0	I	Section address 0 gating signal	1.8	47	DQ11	I/O	Data bus	0.79
21	SD-BS1	I	Section address 1 gating signal	2	48	DQ12	I/O	Data bus	1.16
22	MA10	I	Address bus	0.04	49	VDDQ		3.3V power supply	3.19
23	MA0	I	Address bus	0.36	50	DQ13	I/O	Data bus	1.15
24	MA1	I	Address bus	0.35	51	DQ14	I/O	Data bus	1.24
25	MA2	I	Address bus	2.38	52	VSSQ		Ground	0.01
26	MA3	I	Address bus	1.59	53	DQ15	I/O	Data bus	0.68
27	VDD		3.3V power supply	3.19	54	VSS		Ground	0.01

3.5.4 function introduction to D5954

D5954 (U302) is a servo drive IC with built-in 4-channel drive circuit. Digital focus, trace, feed and main axis drive signal outputted by MT1389 is sent to D5954 for amplifying through RC integration circuit. The focus, trace, feed and main axis drive signal being amplified by D5954 is sent to loader to fulfil the corresponding servo work. The introduction to function pin is shown as the following table:

Pin	Name	Function	Voltage when no disc (V)	DVD disc voltage (V)	CD disc voltage (V)
1	VINFC	Focus control signal input	1.41	1.4	1.45
2	CF1	External feedback loop	2.3	2.54	2.43
3	CF2	External feedback loop	2.01	2.56	2.43
4	VINSL+	Forward control input, connected to reference voltage	1.41	1.42	1.42
5	VINSL-	Main axis control signal input	1.4	1.42	1.42
6	VOSL	External feedback resistor	1.4	1.17	1.21
7	VINFFC	Focus feedback signal input	1.92	2.59	2.36
8	VCC	5V power supply	5.38	5.04	5.01
9	PVCC1	5V power supply	5.38	5.04	5.03
10	PGND	Ground	0.01	0.01	0.01
11	VOSL-	Main axis drive reverse voltage output	1.87	3.71	3.54
12	VO2+	Main axis drive forward direction voltage output	1.87	1.24	1.4
13	VOFC-	Focus drive reverse voltage output	3.3	2.6	2.33
14	VOSC+	Focus drive forward voltage voltage output	3.3	2.46	2.68
15	VOTK+	Trace drive forward direction voltage output	3.39	2.56	2.51
16	VOTK-	Trace drive reverse voltage output	3.52	2.48	2.51
17	VOLD+	Feed drive forward direction voltage output	0.93	2.56	2.5
18	VOLD-	Feed drive reverse voltage output	0.93	2.59	2.62
19	PGND	Ground	0.01	0.01	0.01
20	VINFTK	Trace feedback signal input	3.73	2.5	2.53
21	PVCC2	5V power supply	5.38	5.08	5.07
22	PREGND	Ground	0	0.01	0.01
23	VINLD	Feed control signal input	1.4	1.41	1.4
24	CTK2	External feedback loop	2.41	2.52	2.53
25	CTK1	External feedback loop	2.51	2.52	2.53
26	VINTK	Trace control signal input	1.42	1.42	1.41
27	BIAS	1.4V reference voltage input	1.41	1.42	1.42
28	STBY	Enable control signal	0	3.18	3.19

3.5.5 function introduction to CS4360

CS4360 (U207) is a 6CH audio D/A converter produced by CIRRUS LOGIC company, which can realize digital volume adjustment through software. Each step is with 1DB adjustment coefficient, with 9DB decay range and +3.3V or +5V voltage power supply is adopted, 28 pin casing. The main features include 24-bit sampling accuracy, highest sampling frequency, dynamic range of 02DB, SNR of -90DB. When in 3.3V voltage working mode, power consumption is 105MV. Function pin introduction is shown as the following table.

Pin	Name	Function	Voltage (V)	Pin	Name	Function	Voltage (V)
1	VLS	Serial audio power supply, +3.3V	3.22	15	M2	Mode 2	1.3
2	SDIN1	Serial audio data 1 input	0	16	FILT+	In-phase feedback voltage output	4.89
3	SDIN2	Serial audio data 2 input	0	17	VQ	External filter of static working voltage	2.42
4	SDIN3	Serial audio data 3 input	0	18	MUTEC3	Output 3 mute control	5.03
5	SCLK	Bit clock	1.6	19	AOUTB3	Analog audio 3 output	2.44
6	LRCK	Left/right channel clock	1.52	20	AOUTA3	Analog audio 3 output	2.44
7	MCLK	Main clock input	1.59	21	GND	Ground	0
8	VD	Digital power supply, +3.3V	3.22	22	VA	Analog power supply, +5V	5.04
9	GND	Ground	0	23	AOUTB2	Analog audio 2 output	2.44
10	RST	Reset input	3.21	24	AOUTA2	Analog audio 2 output	2.44
11	SCL	Serial control clock	0.29	25	MUTEC2	Output 2 mute control	5.03
12	SDA	Serial control data	3.22	26	AOUTB1	Analog audio 2 output	2.44
13	CS/M1	Chip selection/mode 1	0	27	AOUTA1	Analog audio 2 output	2.44
14	VLC	Control port power supply, +3.3	3.22	28	MUTEC1	Output 1 mute control	5.03

3.5.6 Function introduction to CS5340

Cs5340 (U210) is a kind of complete A/D converter used in digital audio system. It has sampling, A/D conversion and anti-aliasing filtering function, and can generate 24-bit sampling frequency to left and right channels with serial value of each channel up to 2000 KHz. A 5-step multi-bit DELTA-SIGMA modulator is adopted, with digital filtering and simplification function, so external anti-aliasing filter is not needed. It isspecially applicable for audio system required wide dynamic range, Hi-Fi and low noise.

Pin	Name	Data direction	Function	Remark
1	M0	I	Mode selection	Decide the operation mode of element
2	MCLK	I	Main clock	**Δ** - **δ** clock source of adjustor and digital filter
3	VL	I	Logic power supply	Forward power supply of digital input/output

4	SDOUT	O	Series audio data output	Two's complement of output series audio data
5	GND		Analog	
6	VD	I	Digital power supply	Provide forward power supply for digital part
7	SCLK	I/O	Series clock	Provide series clock for series audio interface
8	LRCK	I/O	Left/right clocl	Left/right audio time sequence control clock
9	RST	I	Reset	Element enters a low-consumption state when in low level
10	AINL	I	Analog input	
11	VQ	O	Static voltage	
12	AINR	I	Analog input	
13	VA	I	Analog power supply	Provide forward power supply for analog part
14	REF_GND		Reference	Provide reference ground for internal sampling circuit
15	FILT+	I	Forward reference voltage	
16	M1	I	Mode selection	Decide the operation mode of element

3.5.7 Function introduction to LM1117MP-1.8

LM1117MP-1.8V is 1.8V voltage regulator, locates on decode board to provide 1.8V stable voltage for MT1389. Pin function is shown as the following table:

Pin	Name	Function	Remark
1	GND	Ground	
2	OUT	1.8V voltage output	1.8V
3	IN	Voltage input	3.3V

3.5.8 Function introduction to HS0038A2

Infrared receiver HS0038A2 or HS0038B has three pins: power supply anode (pin 2), power supply cathode (pin 1) and data output port (pin 3). If 5V is used for power supply, when keeping the state, voltage of data output port is also 5V (HS0038B requires pull-up resistor). The internal part is composed of infrared receiving diode and amplification circuit. To reduce the interference of visible light to working, diode part of infrared receiving usually adopts black resin casing to filter the beam with waveform length below 700nm. The amplification circuit is composed of an integrated block and elements of resistor and capacitor (including amplification, frequency selection and demodulator circuit), cased inside a screen-shielded box.

Pin function is shown as the following figure:

Pin	Name	Function	Voltage	Remark
1	GND	Ground	0	When there is remote control signal, voltage of IR signal changes between 5.1 and 4.1.
2	VCC	Power supply	5.1	
3	IR	Remote control data	5.1	

3.5.9 Function introduction to 4558/TDA1308

4558/4580 includes two integrated operational amplifiers inside, and pin function is shown as the following table:

Pin	Function	Signal flow	Pin	Function	Signal flow
1	Output of operational amplifier A	O	5	Output of operational amplifier B	O
2	Cathode input of port operational amplifier A	I	6	Cathode input of port operational amplifier B	I
3	Anode input port of operational amplifier A	I	7	Anode input of port operational amplifier B	I
4	minus 9V voltage input	I	8	(+) 9V voltage input	I

2. U602 (TDA1308) is a headphone drive chip, and pin function is shown as the following table:

Pin	Name	Function	Signal flow	Pin	Name	Function	Signal flow
1	OUT1	Headphone right channel output	I	5	IN2+	Reference voltage input	I (2.3V)
2	IN1-	Right channel signal input	O	6	IN2-	Left channel signal input	I
3	IN1+	Reference voltage input	I (2.3V)	7	OUT2	Headphone left channel output	O
4	GND	Ground		8	VDD	(+) 5V power supply	

3.5.10 Function introduction to U501 (FDSH321)

Pin 6¡¢7¡¢8 of 5L0380 is controlled by feedback pin 3 to make it on for a while and off for another while to form pulse DC to control coupling quantity of transformer. When secondary output voltage of transformer is on the high side, under the control of pin 3, disconnection time of pin 6¡¢7¡¢8 gets longer and coupling quantity of transformer decreases to make output voltage get lower gradually; when secondary output voltage of transformer is on the low side, disconnection time of pin 6¡¢7¡¢8gets shorter, connection time gets longer (connect inside fsdh321), coupling quantity of transformer decreases and secondary output voltage gets larger gradually. Pin function is shown as the following table:

Pin	Symbol	I/O	Description
1	GND		Sense FET source terminal on primary side and internal control ground.
2	VCC		Positive supply voltage input.

3	Vfd		The feedback voltage pin is the non-inverting input to the PWM comparator.
4	Ipk		Pin to adjust the current limit of the Sense FET.
5	Vstr		This pin connects directly to the rectified AC line voltage source.
6	DRAIN		The Drain pin is designed to connect directly to the primary lead of the transformer and is capable of switching a maximum of 650V. Minimizing the length of the trace connecting this pin to the transformer will decrease leakage inductance.
7	DRAIN		
8	DRAIN		

3.5.11 Function introduction to ncp1200

the NCP1200 represents a major leap toward ultra¨Ccompact Switch¨CMode Power Supplies. Thanks to a novel concept, the circuit allows the implementation of a complete offline battery charger or a standby SMPS with few external components. Furthermore, an integrated output short¨Ccircuit protection lets the designer build an extremely low¨Ccost AC/DC wall adapter associated with a simplified feedback scheme. With an internal structure operating at a fixed 40 kHz, 60 kHz or 100 kHz, the controller drives low gate¨Ccharge switching devices like an IGBT or a MOSFET thus requiring a very small operating power. Thanks to current¨Cmode control, the NCP1200 drastically simplifies the design of reliable and cheap offline converters with extremely low acoustic generation and inherent pulse¨Cby¨Cpulse control.

When the current setpoint falls below a given value, e.g. the output power demand diminishes, the IC automatically enters the skip cycle mode and provides excellent efficiency at light loads. Because this occurs at low peak current, no acoustic noise takes place. Finally, the IC is self¨Csupplied from the DC rail, eliminating the need of an auxiliary winding. This feature ensures operation in presence of low output voltage or shorts.

PIN	Symbol	I/O	Description
1	ADJ	I	Adjust the skipping peak current
2	FB	O	Sets the peak current set point
3	CS	I	Current sense input
4	GND	I	Ground
5	DRV	O	Driving pulses
6	VCC	I	Power supply
7	NC		
8	HV	I	Generates the VCC from the line

3.5.12 Function introduction to U503 (LM431A)

U503 (LM431A) is a 2.5V comparator, shown as the figure 3.5.12.1. Compared the inputted voltage of

R end with 2.5V, when voltage of R end is more than 2.5V, KA end is on and photoelectric coupler starts to send out photocurrent; when voltage of R end is less than 2.5V, KA end is cutoff and photoelectric coupler does not send out photocurrent. CPU+3.3V in power board circuit must be kept in 3.3V, for the function of comparator. No matter more than or less than 3.3V, through on and off status of comparator, it will control the on state of the output end of photoelectric coupler LM431A to adjust the output space occupation ratio of switch module to control the output voltage of transformer and masthead the power supply of the whole system.

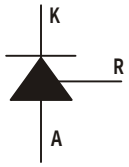


Figure 3.5.12.1 LM431A outside drawing

3.5.13 Function introduction to U502

U502 (2501) is a photoelectric coupler, shown as the figure 3.5.13.1. The right side is a light emitting diode, which sends out light of different intensity according to the strength of voltage inputted from the right side, generates photocurrent of different intensity on the left side according to light of different intensity, and outputs from position D. The higher of the voltage inputted from the right side, the stronger of the light emitted from light emitting diode and the larger of the photocurrent produced from position D. The lower of the voltage inputted from the right side of photoelectric coupler, the weaker of the light emitted from light emitting diode and the weaker of the current outputted from position D.

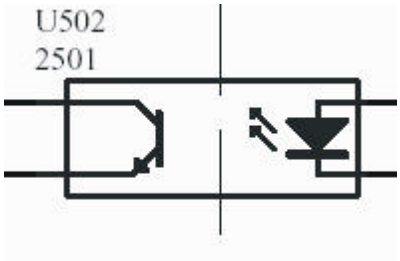


Figure 3.5.13.1 2501 outside drawing

Chapter Four

Disassembly and Assembly Process

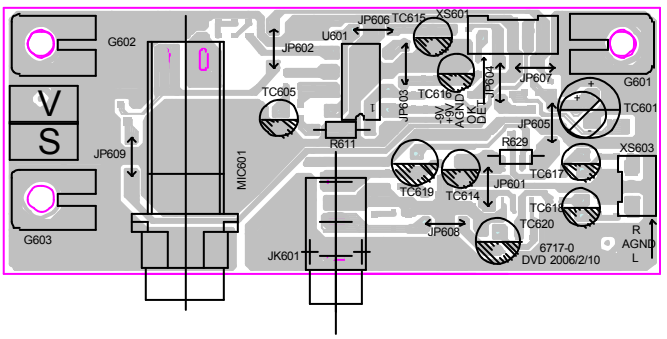
DVD players manufactured in BBK are largely identical but with minor differences and are mainly composed of loader components, control panel components, decode and servo board components, power board components, power amplifier board components, MIC board components and AV board components. In order to speed up the compilation of “Service Manual”, we shall not give repeat explanation to model with minor differences in chapter four “Disassembly and Assembly Process” for the later compiled service manuals. For disassembly and assembly process in this chapter, please refer to chapter 4 of “DK1005S Service Manual” or “DK1020S Service” .

The pictures of this model are shown as follows:

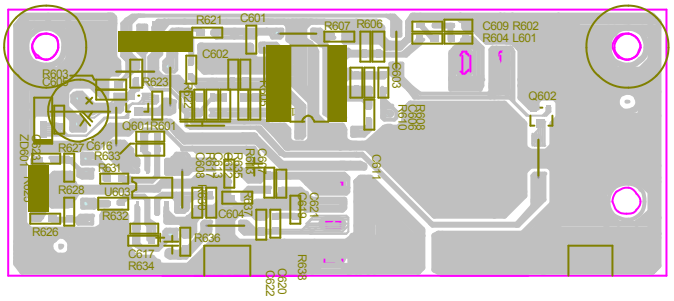
Chapter Cinque
PCB board & Circuit diagram

Section One PCB board

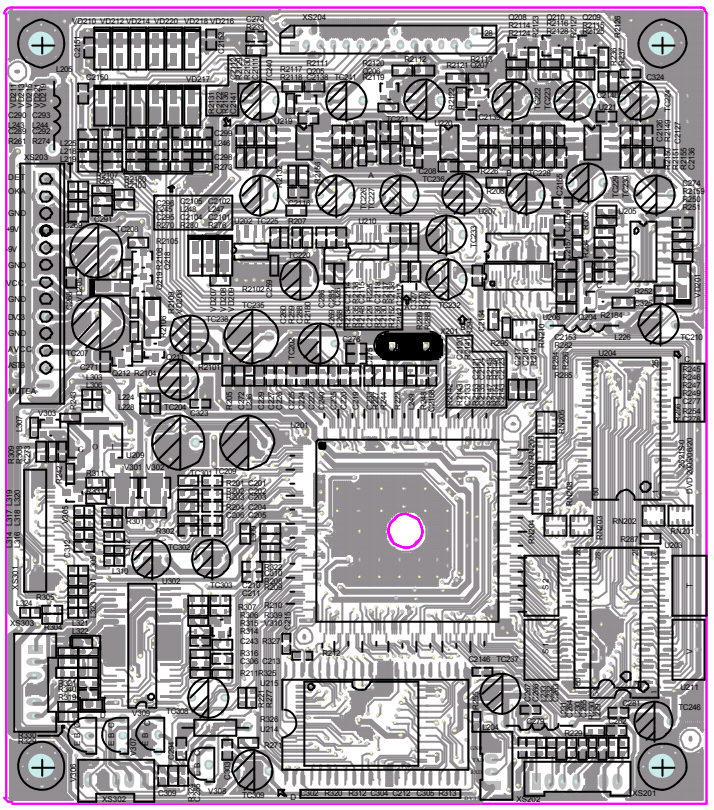
5.1.1 Surface layer of MIC Board



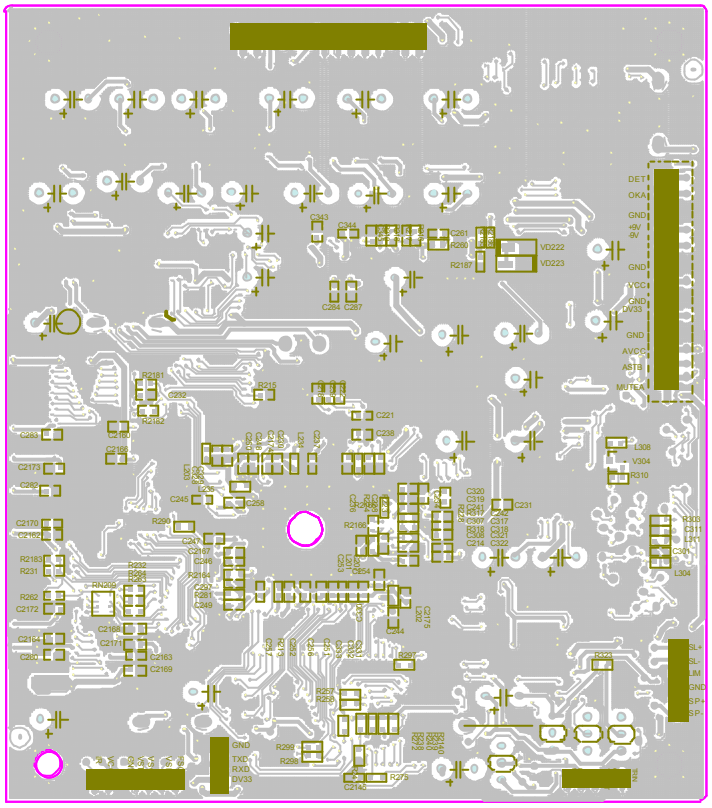
5.1.2 Bottom layer of MIC Board



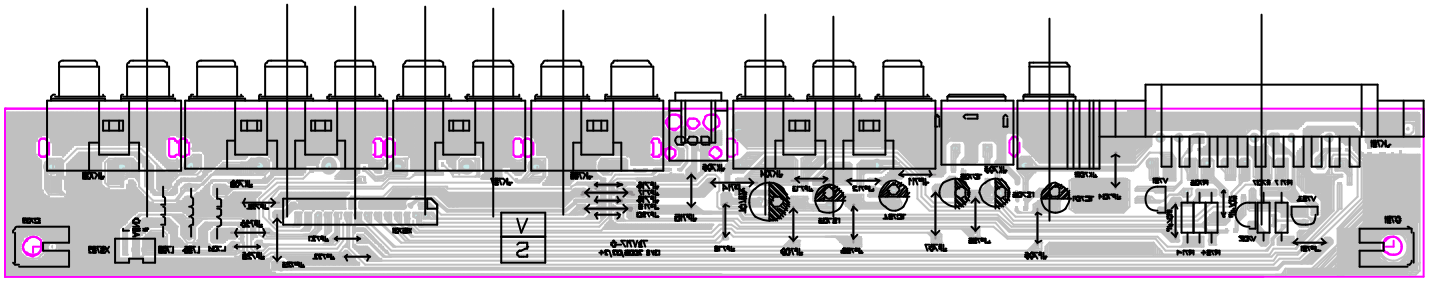
5.1.3 Surface layer of DECODE&SERVO Board



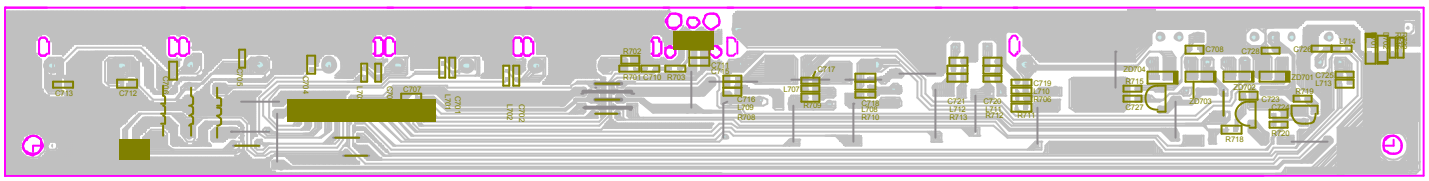
5.1.4 Bottom layer of DECODE&SERVO Board



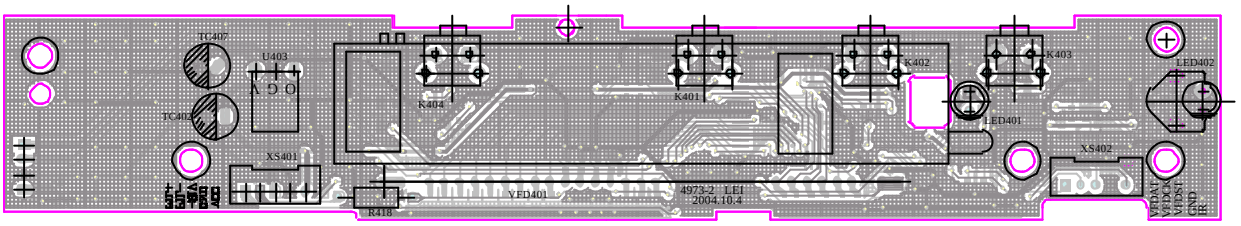
5.1.5 Surface layer of AV OUT Board



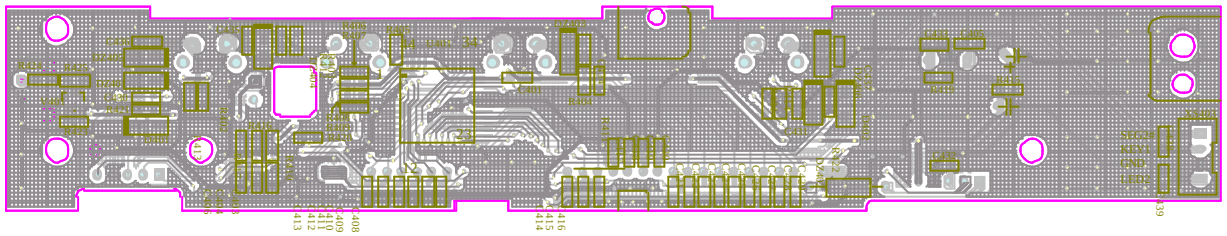
5.1.6 Bottom layer of AV OUT Board



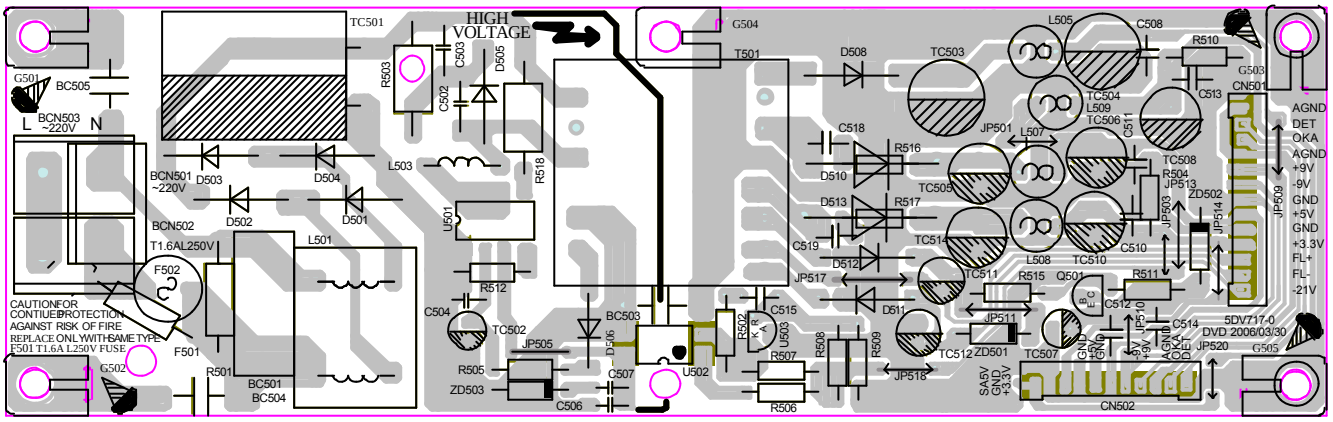
5.1.7 Surface layer of Main panel



5.1.8 Bottom layer of Main panel

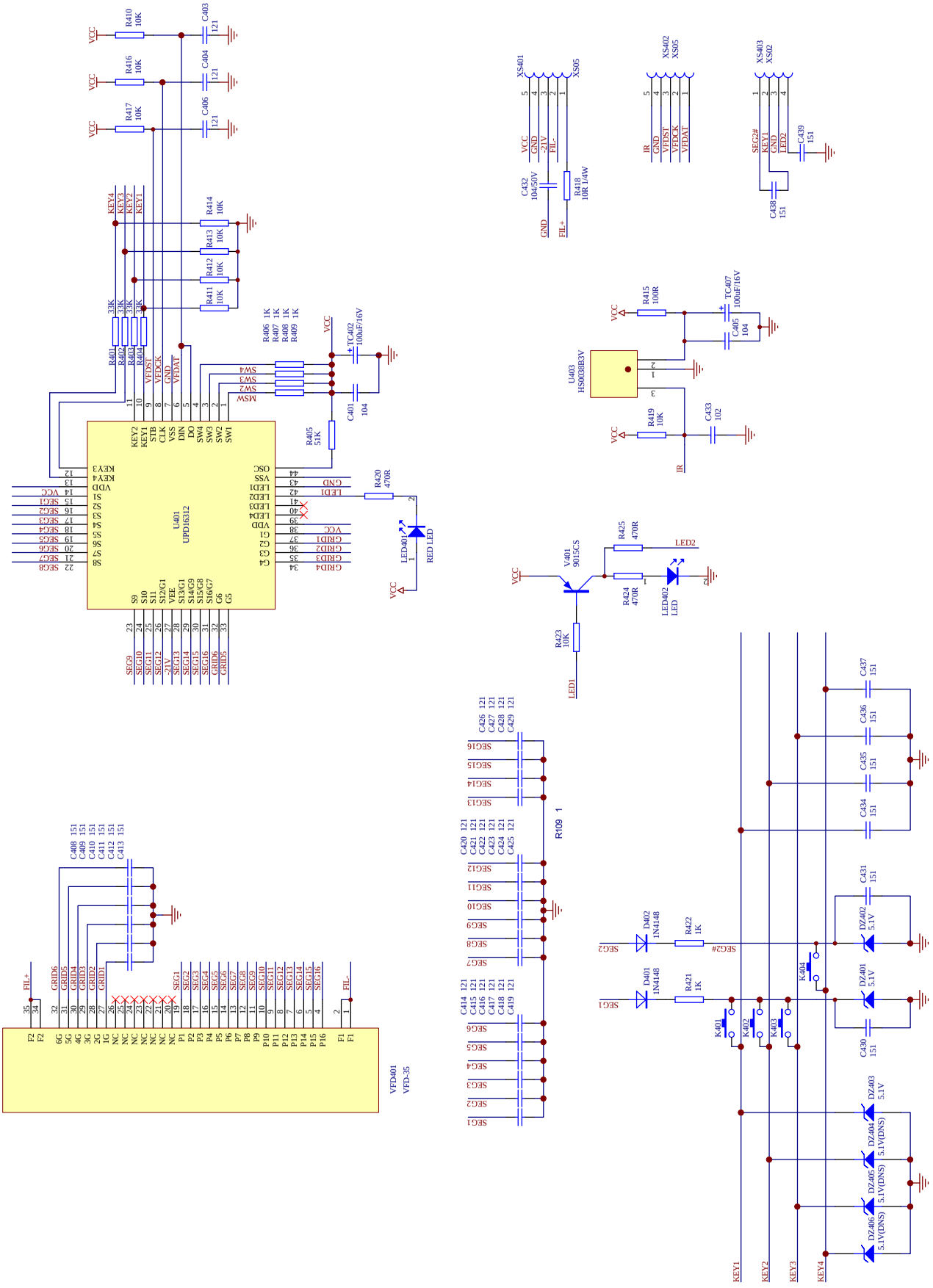


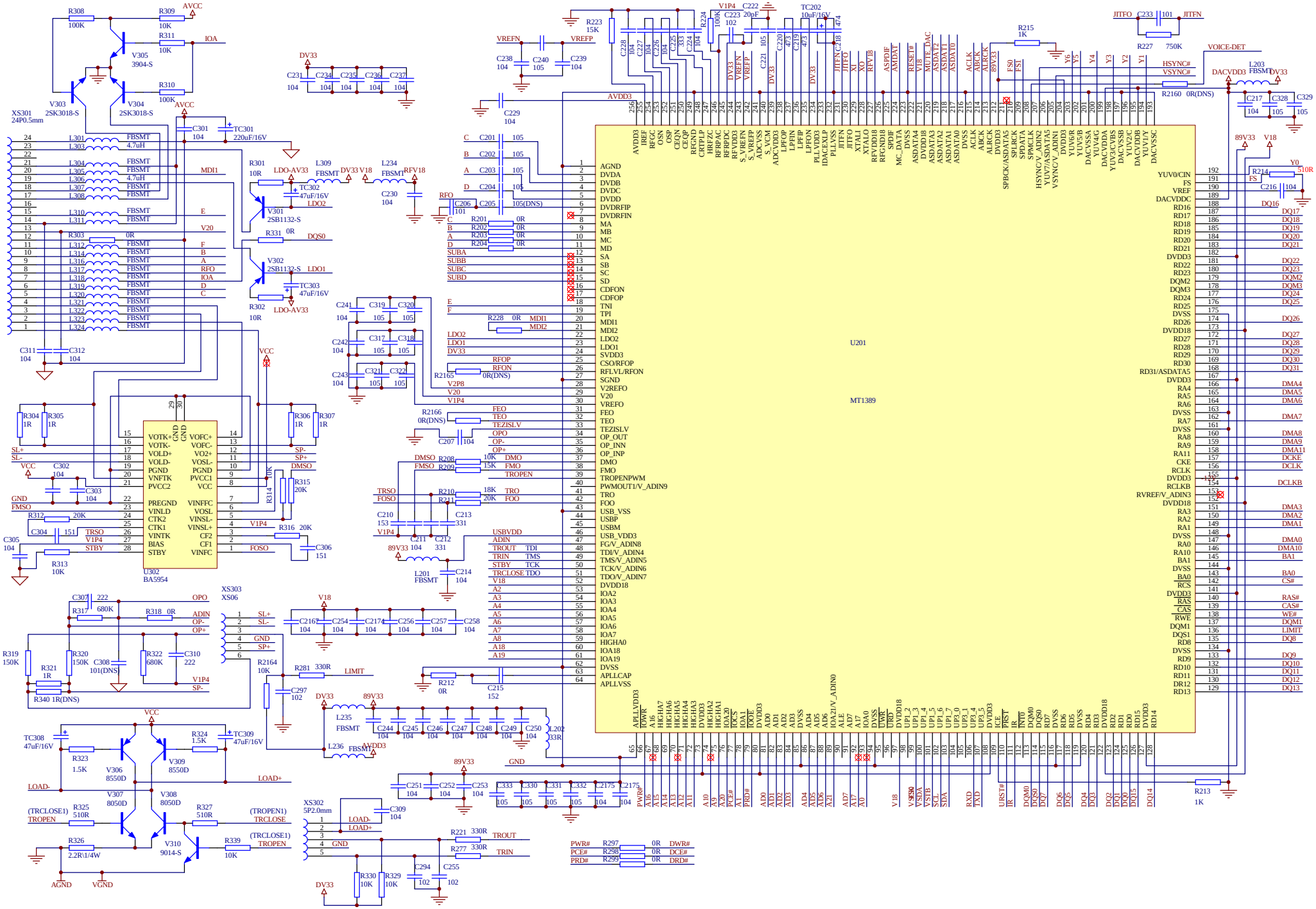
5.1.9 Power Board


HIGH VOLTAGE
CAUTION FOR CONTIUE PROTECTION AGAINST RISK OF FIRE REPLACE ONLY WITH SAME TYPE F501 T1.6A L250V FUSE
T1.6AL250V
BCN503 ~220V
BCN501 ~220V
BCN502
5DV717-0 DVD 2006/03/30
AGND DET OKA AGND +9V -9V GND +5V GND +3.3V FL+ FL- -21V

Section Two circuit diagram

5.2.1 KEY SCAN Board




U201
MT1389
U302
BA5954
XS301
24P0.5mm
XS303
XS06
XS302
5P2.0mm
V301
2SB1132-S
V302
2SB1132-S
V303
2SK3018-S
V304
2SK3018-S
V305
3904-S
V306
8550D
V307
8050D
V308
8050D
V309
8550D
V310
9014-S
AVCC
VCC
AGND
VGND
LDO-AV33
LDO1
LDO2
DV33
V18
V1P4
89V33
AVDD3
MDI1
MDI2
DQS0
LOAD-
LOAD+
LIMIT
TROUT
TRIN
TROPEN
TRCLOSE
(TROPEN1)
(TRCLOSE1)
JITFO
JITFN
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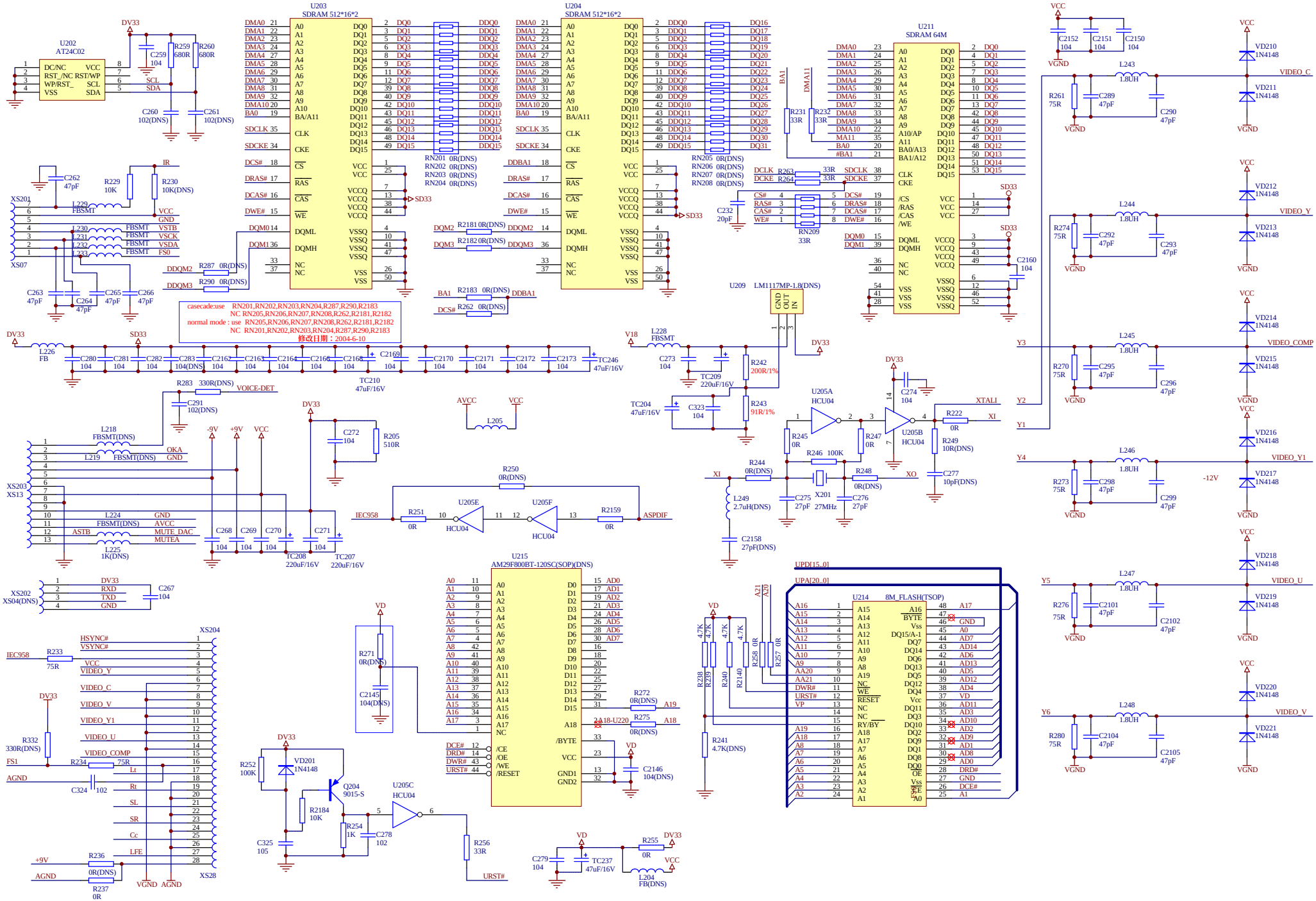
U202
AT24C02
U203
SDRAM 512*16*2
U204
SDRAM 512*16*2
U211
SDRAM 64M
U209 LM1117MP-1.8(DNS)
casecade:use RN201,RN202,RN203,RN204,R287,R290,R2183
NC RN205,RN206,RN207,RN208,R262,R2181,R2182
normal mode : use RN205,RN206,RN207,RN208,R262,R2181,R2182
NC RN201,RN202,RN203,RN204,R287,R290,R2183
修改日期：2004-6-10
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U205B HCU04
U205C HCU04
U205E HCU04
U205F HCU04
U215 AM29F800BT-120SC(SOP)(DNS)
U214 8M_FLASH(TSOP)
VD201 1N4148
Q204 9015-S
XS07
XS13
XS28
XS201
XS202 XS04(DNS)
XS203
XS204
X201 27MHz
VIDEO_C
VIDEO_Y
VIDEO_COMP
VIDEO_Y1
VIDEO_U
VIDEO_V
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XO
-12V
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VOICE-DET
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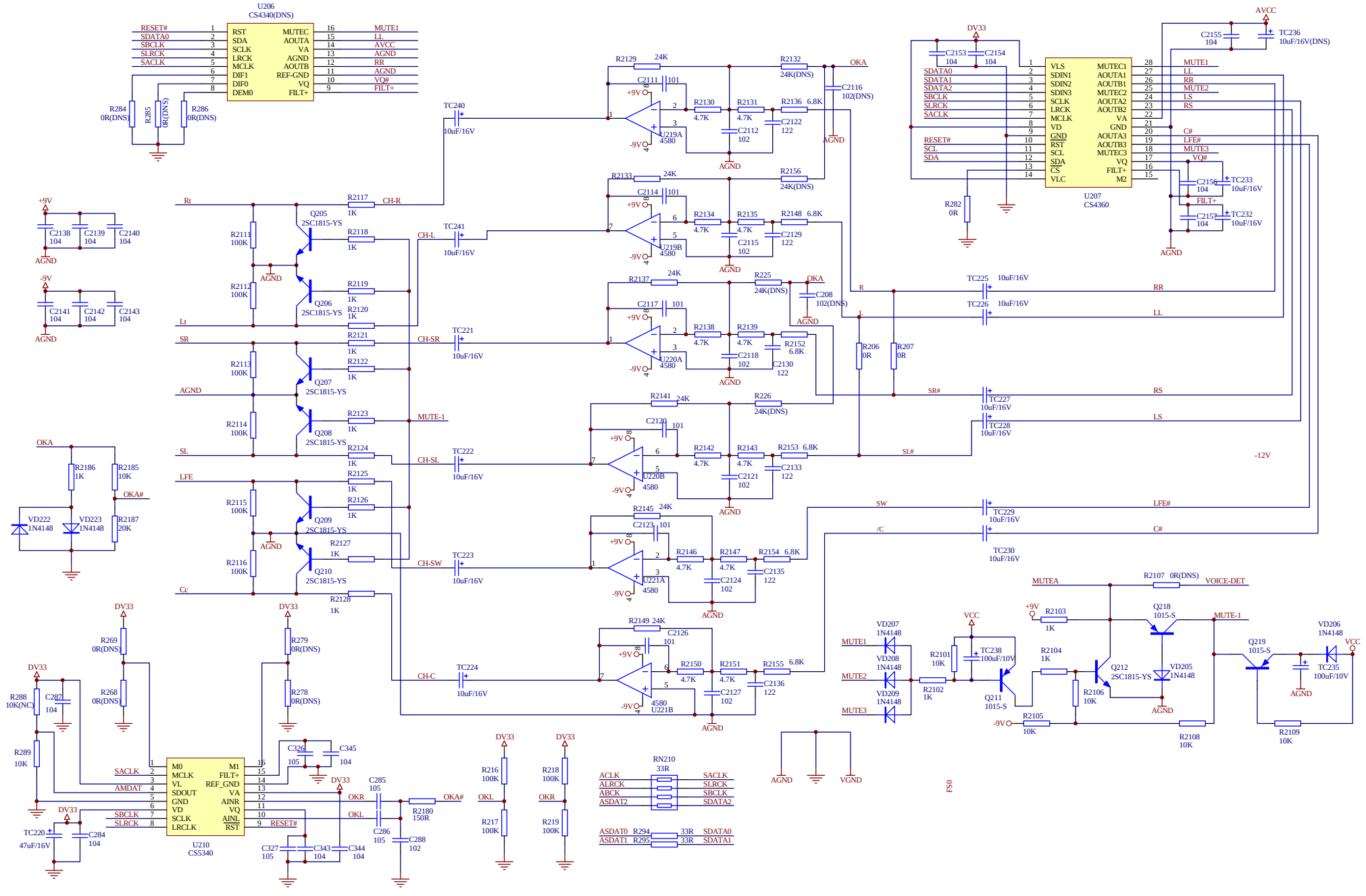
UPA[20..0]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CS4340(DNS)
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SLRCK
SACLK
RST
SDA
SCLK
LRCK
MCLK
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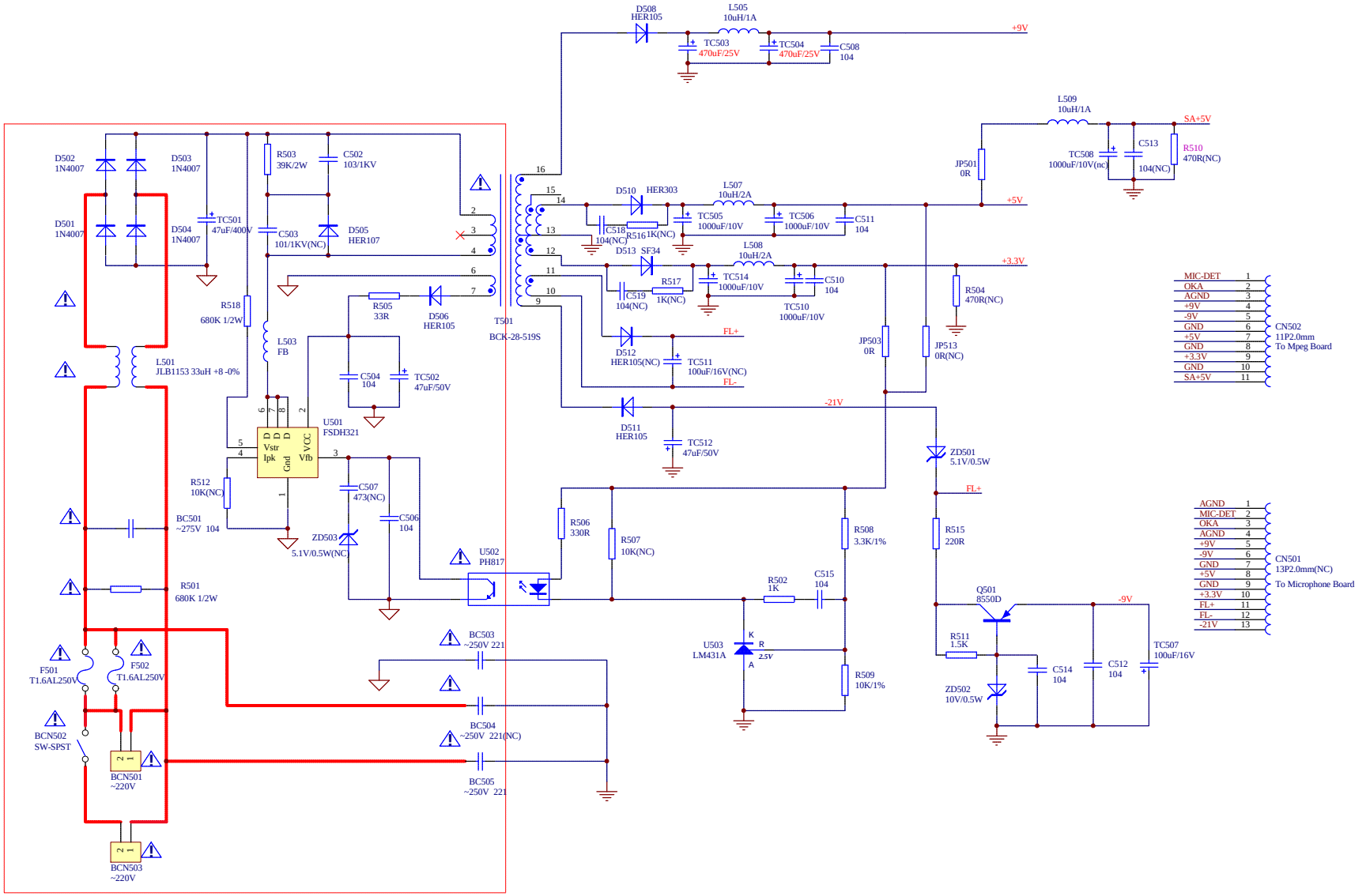
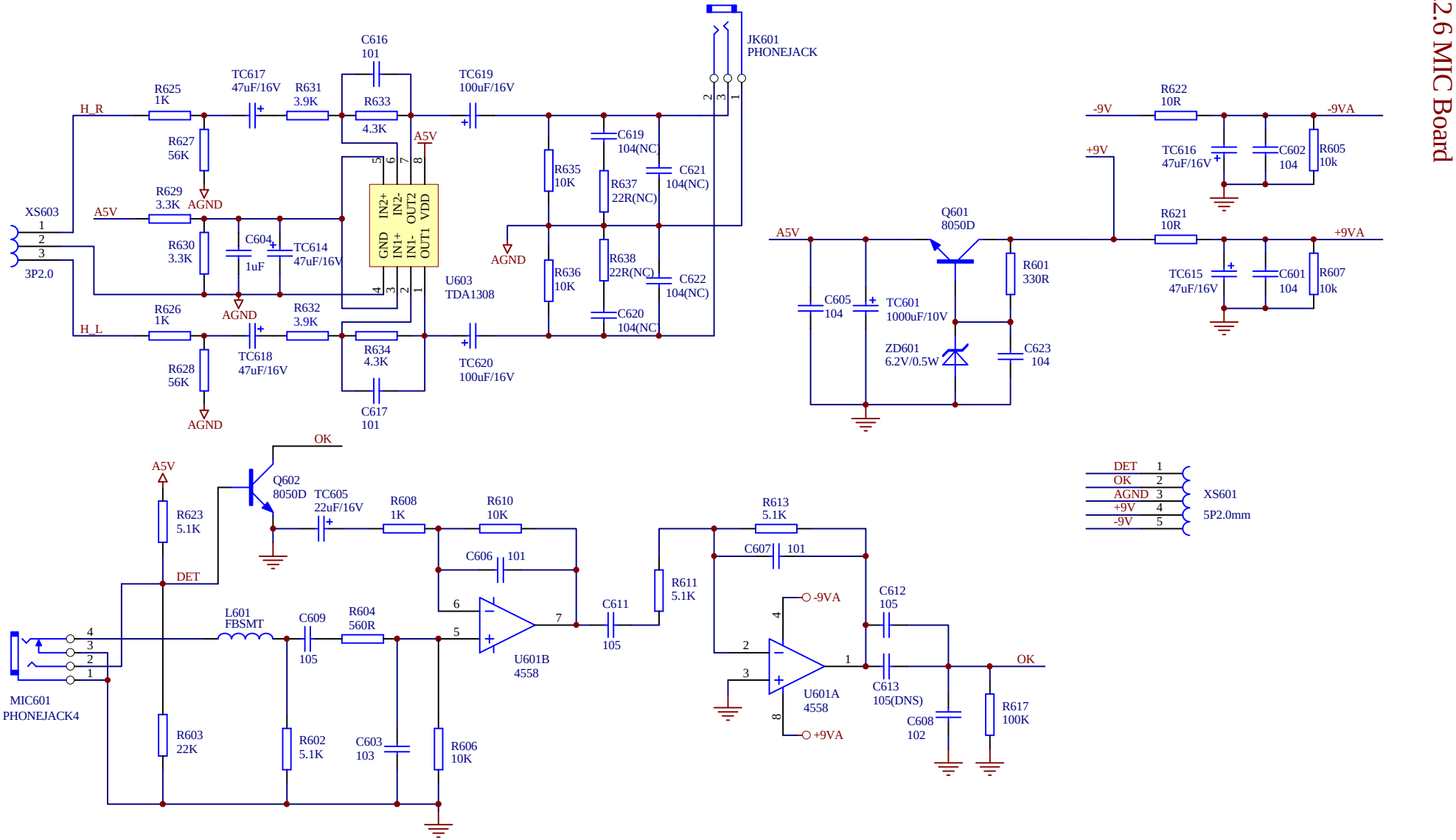
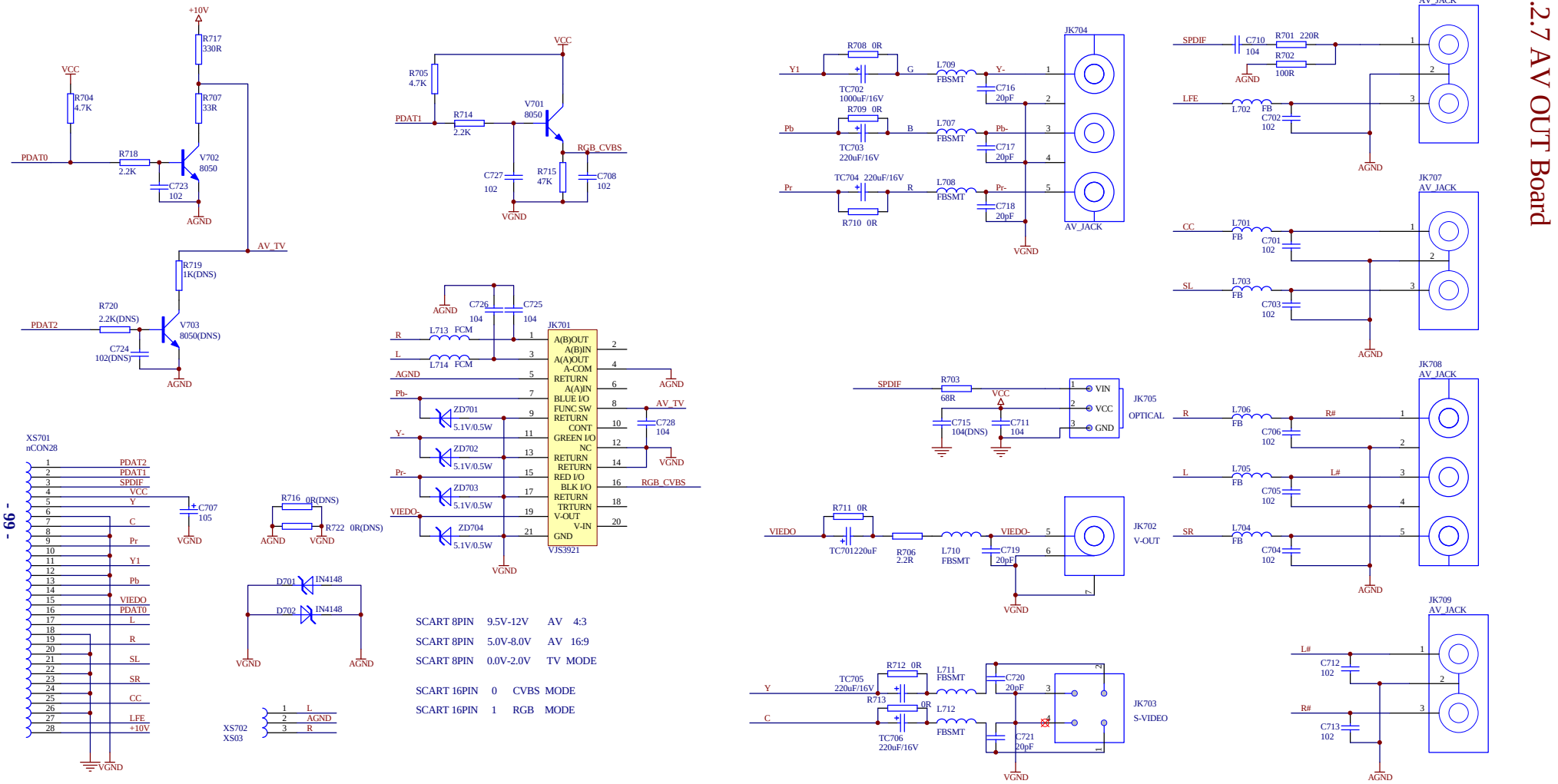
DIF0
DEM0
MUTEC
AOUTA
VA
AGND
AOUTB
REF-GND
VQ
FILT+
MUTE1
LL
AVCC
AGND
RR
AGND
VQ#
FILT+
R284 0R(DNS)
R285 0R(DNS)
R286 0R(DNS)
TC240 10uF/16V
TC241 10uF/16V
TC221 10uF/16V
TC222 10uF/16V
TC223 10uF/16V
TC224 10uF/16V
R2129 24K
R2132 24K(DNS)
OKA
C2116 102(DNS)
C2111 101
R2130 4.7K
R2131 4.7K
R2136 6.8K
C2122 122
C2112 102
U219A 4580
R2133 24K
R2156 24K(DNS)
C2114 101
R2134 4.7K
R2135 4.7K
R2148 6.8K
C2129 122
C2115 102
U219B 4580
R2137 24K
R225 24K(DNS)
C2117 101
R2138 4.7K
R2139 4.7K
R2152 6.8K
C2130 122
C2118 102
U220A 4580
R2141 24K
R226 24K(DNS)
C2120 101
R2142 4.7K
R2143 4.7K
R2153 6.8K
C2133 122
C2121 102
U220B 4580
R2145 24K
C2123 101
R2146 4.7K
R2147 4.7K
R2154 6.8K
C2135 122
C2124 102
U221A 4580
R2149 24K
C2126 101
R2150 4.7K
R2151 4.7K
R2155 6.8K
C2136 122
C2127 102
U221B 4580
+9V
-9V
AGND
DV33
U207
CS4360
VLS
SDIN1
SDIN2
SDIN3
SCLK
LRCK
MCLK
VD
GND
RST
SCL
SDA
CS
VLC
MUTEC1
AOUTA1
AOUTB1
MUTEC2
AOUTA2
AOUTB2
VA
GND
AOUTA3
AOUTB3
MUTEC3
VQ
FILT+
M2
SDATA0
SDATA1
SDATA2
SBCLK
SLRCK
SACLK
RESET#
SCL
SDA
MUTE1
LL
RR
MUTE2
LS
RS
C#
LFE#
MUTE3
VQ#
FILT+
C2155 104
C2153 104
C2154 104
TC236 10uF/16V(DNS)
C2156 104
TC233 10uF/16V
C2157 104
TC232 10uF/16V
R282 0R
R
L
SR#
SL#
SW
/C
TC225 10uF/16V
TC226 10uF/16V
TC227 10uF/16V
TC228 10uF/16V
TC229 10uF/16V
TC230 10uF/16V
RR
LL
RS
LS
LFE#
C#
-12V
R206 0R
R207 0R
Rt
Lt
SR
SL
LFE
Cc
CH-R
CH-L
CH-SR
CH-SL
CH-SW
CH-C
MUTE-1
R2117 1K
R2118 1K
R2119 1K
R2120 1K
R2121 1K
R2122 1K
R2123 1K
R2124 1K
R2125 1K
R2126 1K
R2127 1K
R2128 1K
R2111 100K
R2112 100K
R2113 100K
R2114 100K
R2115 100K
R2116 100K
Q205 2SC1815-YS
Q206 2SC1815-YS
Q207 2SC1815-YS
Q208 2SC1815-YS
Q209 2SC1815-YS
Q210 2SC1815-YS
C2138 104
C2139 104
C2140 104
C2141 104
C2142 104
C2143 104
OKA
R2186 1K
R2185 10K
OKA#
VD222 1N4148
VD223 1N4148
R2187 20K
R269 0R(DNS)
R268 0R(DNS)
R279 0R(DNS)
R278 0R(DNS)
R288 10K(NC)
C287 104
R289 10K
TC220 47uF/16V
C284 104
U210
CS5340
M0
MCLK
VL
SDOUT
GND
VD
SCLK
LRCLK
M1
FILT+
REF_GND
VA
AINR
VQ
AINL
RST
SACLK
AMDAT
SBCLK
SLRCK
RESET#
C326 105
C345 104
C285 105
C286 105
C288 102
C327 105
C343 104
C344 104
R2180 150R
OKR
OKL
OKA#
R216 100K
R217 100K
R218 100K
R219 100K
OKL
OKR
RN210 33R
ACLK
ALRCK
ABCK
ASDAT2
SACLK
SLRCK
SBCLK
SDATA2
ASDAT0 R294 33R SDATA0
ASDAT1 R295 33R SDATA1
AGND
VGND
FS0
MUTEA
R2107 0R(DNS)
VOICE-DET
R2103 1K
Q218 1015-S
MUTE-1
VD206 1N4148
VCC
Q219 1015-S
TC235 100uF/10V
VD207 1N4148
VD208 1N4148
VD209 1N4148
MUTE1
MUTE2
MUTE3
R2101 10K
R2102 1K
TC238 100uF/10V
Q211 1015-S
R2104 1K
Q212 2SC1815-YS
VD205 1N4148
R2106 10K
R2105 10K
R2108 10K
R2109 10K


D508 HER105
L505 10uH/1A
TC503 470uF/25V
TC504 470uF/25V
C508 104
+9V
L509 10uH/1A
SA+5V
TC508 1000uF/10V(nc)
C513
104(NC)
R510 470R(NC)
JP501 0R
+5V
D502 1N4007
D503 1N4007
D501 1N4007
D504 1N4007
TC501 47uF/400V
R503 39K/2W
C502 103/1KV
C503 101/1KV(NC)
D505 HER107
D510 HER303
L507 10uH/2A
TC505 1000uF/10V
TC506 1000uF/10V
C511 104
C518 104(NC)
R516 1K(NC)
D513 SF34
L508 10uH/2A
+3.3V
TC514 1000uF/10V
C510 104
TC510 1000uF/10V
R517 1K(NC)
C519 104(NC)
R504 470R(NC)
R518 680K 1/2W
R505 33R
D506 HER105
T501 BCK-28-519S
L503 FB
L501 JLB1153 33uH +8 -0%
C504 104
TC502 47uF/50V
FL+
D512 HER105(NC)
TC511 100uF/16V(NC)
FL-
JP503 0R
JP513 0R(NC)
-21V
D511 HER105
TC512 47uF/50V
U501 FSDH321
D Vstr
D Ipk
D Gnd
VCC Vfb
ZD501 5.1V/0.5W
R512 10K(NC)
C507 473(NC)
C506 104
ZD503 5.1V/0.5W(NC)
BC501 ~275V 104
R501 680K 1/2W
U502 PH817
R506 330R
R507 10K(NC)
R508 3.3K/1%
R515 220R
R502 1K
C515 104
Q501 8550D
-9V
U503 LM431A
2.5V
R509 10K/1%
R511 1.5K
ZD502 10V/0.5W
C514 104
C512 104
TC507 100uF/16V
F501 T1.6AL250V
F502 T1.6AL250V
BC503 ~250V 221
BC504 ~250V 221(NC)
BC505 ~250V 221
BCN502 SW-SPST
BCN501 ~220V
BCN503 ~220V
MIC-DET 1
OKA 2
AGND 3
+9V 4
-9V 5
GND 6
+5V 7
GND 8
+3.3V 9
GND 10
SA+5V 11
CN502 11P2.0mm To Mpeg Board
AGND 1
MIC-DET 2
OKA 3
AGND 4
+9V 5
-9V 6
GND 7
+5V 8
GND 9
+3.3V 10
FL+ 11
FL- 12
-21V 13
CN501 13P2.0mm(NC) To Microphone Board


JK601
PHONEJACK
C616
101
TC617
47uF/16V
R625
1K
R631
3.9K
R633
4.3K
TC619
100uF/16V
H_R
R627
56K
A5V
R629
3.3K
AGND
XS603
1
2
3
3P2.0
C604
1uF
TC614
47uF/16V
R630
3.3K
AGND
R626
1K
R632
3.9K
H_L
R628
56K
AGND
TC618
47uF/16V
R634
4.3K
C617
101
TC620
100uF/16V
U603
TDA1308
GND
IN1+
IN1-
OUT1
VDD
IN2+
IN2-
OUT2
AGND
R635
10K
R636
10K
C619
104(NC)
R637
22R(NC)
C621
104(NC)
R638
22R(NC)
C622
104(NC)
C620
104(NC)
Q601
8050D
A5V
C605
104
TC601
1000uF/10V
ZD601
6.2V/0.5W
R601
330R
C623
104
-9V
+9V
R622
10R
TC616
47uF/16V
C602
104
R605
10k
-9VA
R621
10R
TC615
47uF/16V
C601
104
R607
10k
+9VA
DET
OK
AGND
+9V
-9V
XS601
5P2.0mm
A5V
R623
5.1K
DET
Q602
8050D
OK
TC605
22uF/16V
R608
1K
R610
10K
C606
101
L601
FBSMT
C609
105
R604
560R
MIC601
PHONEJACK4
R603
22K
R602
5.1K
C603
103
R606
10K
U601B
4558
C611
105
R611
5.1K
R613
5.1K
C607
101
-9VA
U601A
4558
+9VA
C612
105
C613
105(DNS)
C608
102
R617
100K
OK



SCART 8PIN 9.5V-12V AV 4:3

SCART 8PIN 5.0V-8.0V AV 16:9

SCART 8PIN 0.0V-2.0V TV MODE

SCART 16PIN 0 CVBS MODE

SCART 16PIN 1 RGB MODE

Chapter six BOM List

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
DV717SI(RU) SILVER [1389C]			
AV BOARD PCB SEMI-FINISHED PRODUCT		5448071	
0000289	CARBON FILM RESISTOR	1/4W4.7K±5% SHAPED 10	R704,R705
0000278	CARBON FILM RESISTOR	1/4W330O±5% SHAPED 10	R717
0000273	CARBON FILM RESISTOR	1/4W33O±5% SHAPED 10	R707
0000286	CARBON FILM RESISTOR	1/4W2.2K±5% SHAPED 10	R714
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R708~R713
0090002	SMD RESISTOR	1/16W 2.2O±5%	R706
0090238	SMD RESISTOR	1/16W 68O±5% 0603	R703
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R702
0090008	SMD RESISTOR	1/16W 220O±5%	R701
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R718
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R715
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C716~C721
0310066	SMD CAPACITOR	50V 102±10% 0603	C701~C706,C708,C712,C713,C723,C725,C726,C727
0310207	SMD CAPACITOR	50V104±20% 0603	C710,C711,C728
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	C707
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L704,L705,L706
0390095	SMDMAGNETIC BEADS	FCM1608K-221T05	L701~L703,L707~L714
0700007	SMD DIODE	1N4148	D701,D702 ①
0700001	SMD DIODE	LS4148	D701,D702 ①
0700002	SMD DIODE	LL4148	D701,D702 ①
0700004	SMD VOLTAGE REGULATOR DIODE	5.1V±5% 1/2W	ZD701~ZD704
0780050	TRIODE	S8050D	V701,V702
1090045	ELECTRO-OPTICTRANSFORMER	TX179ATW	JK705 ②
1090024	ELECTRO-OPTICTRANSFORMER	TX179AT	JK705 ②
1910132	TERMINAL SOCKET	AV2-8.4(WHITE、WHITE)	JK707
1910208	TERMINAL SOCKET	AV2-8.4(RED、WHITE)	JK709
1910133	TERMINAL SOCKET	AV2-8.4(RED、BLACK)	JK706
1910131	TERMINAL SOCKET	AV3-8.4(RED、WHITE、RED)	JK708

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1860029	SCART SOCKET	SCART-01	JK701
1910006	TERMINAL SOCKET	S-VIDEO	JK703
1910081	TERMINAL SOCKET	AV1-8.4-5G-2 YELLOW	JK702
1910057	TERMINAL SOCKET	AV3-8.4-6G-2	JK704
1940140	CABLE SOCKET	14P 1.0mm STRAIGHT DUAL LINE PLUG	XS701
1940026	SOCKET	3P 2.0mm	XS702
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	JP701,JP703,JP705,JP706,JP708~JP713,JP715,JP724,JP726,JP704
2100010	CONNECTED CORDS	F 0.6 SHAPED 5mm	JP702,JP716,JP718,JP720~JP722,JP725
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	JP707,JP714,JP717,JP719,JP723
3870115	GROUND CHIP OF POWER BOARD	AB903	G701,G702
1564185	PCB	7DV717-0	
DV717SI(RU) SILVER [1389C]			
DECODE BOARD PCB SEMI-FINISHED PRODUCT: 2521S-0			
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R201~R204,R212,R222,R228,R236,R245,R247,R251,R255,R257,R258,R282,R297~R299,R303,R318,R331,R2159,R234,R269,R279,R2160
0090006	SMD RESISTOR	1/16W 75O±5% 0603	R233,R261,R270,R273,R274,R276,R280
0090272	SMD RESISTOR	1/16W 1O±5% 0603	R304~R307,R321
0090003	SMD RESISTOR	1/16W 10O±5% 0603	R301,R302
0090005	SMD RESISTOR	1/16W 33O±5% 0603	R231,R232,R256,R263,R264,R294,R295,L202
0090232	SMD RESISTOR	1/16W 150O±5% 0603	R2180
0090009	SMD RESISTOR	1/16W 330O±5% 0603	R221,R277,R281
0090013	SMD RESISTOR	1/16W 680O±5% 0603	R259,R260
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R213,R215,R254,R2102~R2104,R2117~R2128,R2186,L225
0090016	SMD RESISTOR	1/16W 1.5K±5% 0603	R323,R324
0090249	SMD RESISTOR	1/16W 510O±5% 0603	R205,R214,R325,R327,R283
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R238~R240,R2130,R2131,R2134,R2135,R2138~R2140,R2142,R2143,R2146,R2147,R2150,R2151
0090021	SMD RESISTOR	1/16W 6.8K±5% 0603	R2136,R2148,R2152~R2155
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R208,R229,R309,R311,R313,R314,R329,R330,R339,R2101,R2106,R2108,R2109,R2164,R2184,R289,R2105,R2185
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R209,R223
0090025	SMD RESISTOR	1/16W 20K±5% 0603	R211,R312,R315,R316,R2187

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090255	SMD RESISTOR	1/16W 24K±5% 0603	R2129,R2133,R2137,R2141,R2145,R2149
0090188	SMD RESISTOR	1/16W 18K±5% 0603	R210
0090197	SMD RESISTOR	1/16W 150K±5% 0603	R319,R320
0090211	SMD RESISTOR	1/16W 680K±5% 0603	R317,R322
0090609	PRECISION SMD RESISTOR	1/16W 100O±1% 0603	R243
0090626	PRECISION SMD RESISTOR	1/16W 200O±1% 0603	R242
0090319	PRECISION SMD RESISTOR	1/16W 750K±1% 0603	R227
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R224,R246,R252,R308,R310,R2111~R2116, R216~R219
0100019	SMD RESISTOR NETWORKS	1/16W 33O±5% 8P	RN209,RN210
00003759	CARBON FILM RESISTOR	1/4W2.2O±5% BELT	R326
02604379	CD	CD11 16V10U±20%5×11C5 BELT	TC202,TC221~TC230,TC232,TC233,TC240, TC241
02601819	CD	CD11 16V220U±20%6×12 C5 BELT	TC207~TC209,TC301
02600029	CD	CD11 16V47U±20%5×11 C5 BELT	TC204,TC210,TC237,TC246,TC302,TC303,TC308,TC309
02601889	CD	CD11 16V100U±20%6×12 C5 BELT	TC235,TC238
1940023	SOCKET	7P 2.0mm	XS201
0310085	SMD CAPACITOR	50V 20P ±5% NPO 0603	C222,C232
0310190	SMD CAPACITOR	50V 27P ±5% NPO 0603	C275,C276
0310045	SMD CAPACITOR	50V 47P ±5% NPO 0603	C262~C266,C289,C290,C292,C293,C295,C296,C298,C299,C2101,C2102,C2104,C2105
0310047	SMD CAPACITOR	50V 101 ±5% NPO 0603	C206,C233,C2111,C2114,C2117,C2120,C2123,C2126,C288
0310051	SMD CAPACITOR	50V 331 ±5% NPO 0603	C212,C213
0310048	SMD CAPACITOR	50V 151 ±5% NPO 0603	C304,C306
0310207	SMD CAPACITOR	50V104 ±20% 0603	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267~C274,C279~C282,C301~C303,C305,C309,C311,C312,C323,C2138~C2143,C2150~C2157,C2160,C2162~C2164,C2166~C2175,C284,C287,C343~C345 ③
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267~C274,C279~C282,C301~C303,C305,C309,C311,C312,C323,C2138~C2143,C2150~C2157,C2160,C2162~C2164,C2166~C2175,C284,C287,C343~C345 ③
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	C201~C204,C221,C240,C317~C322,C325,C328~C333,C326,C327,C285,C286
0310066	SMD CAPACITOR	50V 102 ±10% 0603	C223,C255,C278,C294,C297,C2112,C2115,C2118,C2121,C2124,C2127
0310231	SMD CAPACITOR	50V 122 ±10% 0603	C2122,C2129,C2130,C2133,C2135,C2136

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310067	SMD CAPACITOR	50V 152 ±10% 0603	C215
0310068	SMD CAPACITOR	50V 222 ±10% 0603	C307,C310
0310201	SMD CAPACITOR	50V 153 ±10% 0603	C210
0310055	SMD CAPACITOR	16V 333 ±10% 0603	C225
0310056	SMD CAPACITOR	16V 473 ±10% 0603	C219,C220
0310362	SMD CAPACITOR	16V474 +80%-20% 0603	C218
0390355	SMD INDUCTOR	4.7UH ±10% 1608	L303,L306
0390096	SMD INDUCTOR	1.8UH ±10% 1608	L243~L248
03900579	MAGNETIC BEADS INDUCTOR	RH354708 BELT	L226
0390095	SMDMAGNETIC BEADS	FCM1608K-221T05	L201,L203,L228~L236,L301,L304,L305,L307 ~L312,L314,L316~L324,L218,L219
0960020	CRYSTAL OSCILLATOR	27.00MHz 49-S	X201
1632368	PCB	2521S-0	
0700007	SMD DIODE	1N4148	VD201,VD205~VD223 ④
0700001	SMD DIODE	LS4148	VD201,VD205~VD223 ④
0700002	SMD DIODE	LL4148	VD201,VD205~VD223 ④
07800509	TRIODE	S8050D BELT	V307,V308
07800499	TRIODE	S8550D BELT	V306,V309
0780062	SMD TRIODE	9014C	V310
0780063	SMD TRIODE	9015C	Q204
0780197	SMD TRIODE	C1815	Q205~Q210,Q212
0780198	SMD TRIODE	2SA1015	Q211,Q218,Q219
0780040	SMD TRIODE	3904(100-300) SOT-23	V305
0780193	SMD TRIODE	2SK3018	V303,V304
0780115	SMD TRIODE	2SB1132	V301,V302
0880185	IC	NJM4558M SOP	U219,U220,U221 ⑤
0880562	IC	4580 SOP	U219,U220,U221 ⑤
0880361	IC	4558 SOP	U219,U220,U221 ⑤
0880322	IC	MM74HCU04M SOP	U205 ⑥
0880513	IC	HCU04 SOP	U205 ⑥
0881415	IC	HY57V641620HGT-7 TSOP	U211 ⑦
0881872	IC	KSV464P4JA-70 TSOP	U211 ⑦
0881182	IC	LM1117MP-ADJ SOT-223	U209

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0881057	IC	CS4360 SSOP	U207
0882353	IC	CS5340 TSSOP	U210
0881031	IC	24C02N SOP	U202
0882257	IC	MT1389FE/C (C VERSION) QFP	U201
0881378	IC	BA5954FP HSOP	U302
1940140	CABLE SOCKET	14P 1.0mm STRAIGHT DUAL LINE PLUG	XS204
1940024	SOCKET	5P 2.0mm	XS302
1940005	SOCKET	6P 2.0mm	XS303
1940098	SOCKET	11P 2.5mm	XS203
1940094	CABLE SOCKET	24P 0.5mm SMD WITH CLASP	XS301
DV717SI(RU) SILVER [1389C]			
MAIN PANEL PCB SEMI-FINISHED PRODUCT		5444529	
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R403
0310207	SMD CAPACITOR	50V104 ±20% 0603	C401 ⑧
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C401 ⑧
0310048	SMD CAPACITOR	50V 151 ±5% NPO 0603	C402,C403
0310376	SMD TANTALUMCAPACITOR	NRS10V47U±20%3528(B2)	TC401
0700002	SMD DIODE	LL4148	VD401,VD402,VD403 ⑨
0700001	SMD DIODE	LS4148	VD401,VD402,VD403 ⑨
0700007	SMD DIODE	1N4148	VD401,VD402,VD403 ⑨
0700056	SMD DOUBLE DIODE	MMBD4148SE SOT-23	D401~D410
0970003	CERAMIC RESONATOR	455E	X401
0881587	IC	PT2222A SOP	U401
1940150	SOCKET	4P1.0mm SMD	XS401
0780129	SMD TRIODE	8550D	V401
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R401
1632060	PCB	4373-3	
DV717SI(RU) SILVER [1389C]			
OK BOARD PCB SEMI-FINISHED PRODUCT		5448072	
0090003	SMD RESISTOR	1/16W 10O±5% 0603	R621,R622
0090009	SMD RESISTOR	1/16W 330O±5% 0603	R601
0090012	SMD RESISTOR	1/16W 560O±5% 0603	R604

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R608,R625,R626
0090018	SMD RESISTOR	1/16W 3.3K±5% 0603	R630
0090224	SMD RESISTOR	1/16W 3.9K±5% 0603	R631, R632
0090184	SMD RESISTOR	1/16W 4.3K±5% 0603	R633, R634
0090020	SMD RESISTOR	1/16W 5.1K±5% 0603	R602, R613, R623
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R606,R610,R635,R636
0090026	SMD RESISTOR	1/16W 22K±5% 0603	R603
0090030	SMD RESISTOR	1/16W 56K±5% 0603	R627,R628
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R617
0310047	SMD CAPACITOR	50V 101 ±5% NPO 0603	C606, C607, C616, C617
0310066	SMD CAPACITOR	50V 102 ±10% 0603	C608
0310072	SMD CAPACITOR	50V 103 ±10% 0603	C603
0310207	SMD CAPACITOR	50V104 ±20% 0603	C601,C602,C604,C605,C623 ⑩
0310222	SMD CAPACITOR	25V 104 ±20% X7R 0603	C601,C602,C604,C605,C623 ⑩
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C601,C602,C604,C605,C623 ⑩
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	C609,C611,C612
0000339	CARBON FILM RESISTOR	1/6W3.3K±5% SHAPED 7.5	R629
0000134	CARBON FILM RESISTOR	1/6W5.1K±5% SHAPED 7.5	R611
0260094	CD	CD110 16V47U±20%5×11 2	TC614 ~ TC618 (11)
0260025	CD	CD11 16V47U±20%5×11 2	TC614 ~ TC618 (11)
0260200	CD	CD11C 16V47U±20%5×7 2	TC614 ~ TC618 (11)
0260327	CD	GZ16V100U±20%6×12 2.5	TC619, TC620 (12)
0260027	CD	CD11 16V100U±20%6×12 2.5	TC619, TC620 (12)
0260096	CD	CD110 16V100U±20%6×12 2.5	TC619, TC620 (12)
0260175	CD	CD11C 16V100U+20%-15%6×7 2.5	TC619, TC620 (12)
0260201	CD	CD11C 16V100U±20%6×7 2.5	TC619, TC620
0260021	CD	CD11 16V22U±20%5×11 2	TC605 (13)
0260037	CD	CD11 25V22U±20%5×11 2	TC605 (13)
0390095	SMDMAGNETIC BEADS	FCM1608K-221T05	L601
0260237	CD	CD11 10V1000U±20%8×14 3.5	TC601 (14)
0260352	CD	GS 10V1000U±20%8×14 3.5	TC601 (14)
0700020	SMD VOLTAGE REGULATOR DIODE	6.2V ±5% 1/2W	ZD601

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0780085	SMD TRIODE	8050D	Q601,Q602
0880124	IC	NJM4558D DIP	U601 (15)
0880308	IC	KA4558 DIP	U601 (15)
0881537	IC	TDA1308 SOP	U603
1980018	MICROPHONE SOCKET	CK3-6.35-24	MIC601
1940024	SOCKET	5P 2.0mm	XS601
2121631	FLAT CABLE	3P120 2.0 2 PIN,WITH NEEDLE,TOGETHER DIRECTION	XS603
1564176	PCB	6717-0	
2100010	CONNECTED CORDS	F 0.6 SHAPED 5mm	JP601 ~ JP609
1980046	EARPHONE SOCKET	ST-301-030-100	JK601
3870115	GROUND CHIP OF POWER BOARD	AB903	G601, G602
DV717SI(RU) SILVER [1389C]			
POWER BOARD PCB SEMI-FINISHED PRODUCT 5448070			
2100010	CONNECTED CORDS	F 0.6 SHAPED 5mm	JP503,JP510,JP520
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	JP501,JP505,JP509,JP514,JP518
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	JP511,JP517
0010337	METAL OXIDE FILM RESISTOR	2W180K±5% SHAPED FLAT 15×7	R518
0000273	CARBON FILM RESISTOR	1/4W33O±5% SHAPED 10	R505
0000362	CARBON FILM RESISTOR	1/4W220O±5% SHAPED 10	R515
0000278	CARBON FILM RESISTOR	1/4W330O±5% SHAPED 10	R506
0000279	CARBON FILM RESISTOR	1/4W470O±5% SHAPED 10	R510
0000284	CARBON FILM RESISTOR	1/4W1.5K±5% SHAPED 10	R511
0000283	CARBON FILM RESISTOR	1/4W1K±5% SHAPED 10	R502
0010115	METAL FILM RESISTOR	1/4W3.3K±1% SHAPED 10	R508
0010064	METAL FILM RESISTOR	1/4W10K±1% SHAPED 10	R509,R512
0010159	METAL OXIDE FILM RESISTOR	2W39K±5%SHAPED FLAT 15×7	R503
0070016	HIGH PRESSURE RESISTOR	@1/2W680K±5% VDE	R501
0200138	PORCELAINCAPACITOR	50V 104±20% 5mm	C504,C508,C510~C512,C515
0210023	TERYLENECAPACITOR	100V 223±10% 5mm	C506
0200359	CERAMICCAPACITOR	@250V 221±10% 10mm VDE	BC503,BC505 (16)
0200376	CERAMIC CAPACITOR	@250V 221 ±20% 10mm VDE	BC503,BC505 (16)
0200223	PORCELAINCAPACITOR	1000V 101 +80%-20% 7.5mm	C503 (17)

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0200228	PORCELAINCAPACITOR	1000V 101±10% 7.5mm	C503 (17)
0200224	PORCELAINCAPACITOR	1000V 103 +80%-20% 7.5mm	C502
0210204	ANTI-JAMMINGCAPACITOR	@MKP61 X2 275VAC 104M 15 UL	BC501 (18)
0210207	TERYLENECAPACITOR	@275V 104±20% 15mm VDE	BC501 (18)
0210206	TERYLENECAPACITOR	@275V104±10%15mm VDE	BC501 (18)
0260557	CD	CD11T 16V100u±20%6×12 2.5	TC507,TC511
0260686	CD	CD11T 25V220U±20%8×12 C5	TC504
0260559	CD	CD11T 50V47u±20%6×12 2.5	TC512
0260564	CD	CD11T 50V10U±20%5×11 2	TC502
0260560	CD	CD11T 10V1000u±20%8×16 3.5	TC506,TC510
0260341	CD	ZT 400V22μ±20%f 16×20 7.5	TC501
0260726	CD	CD288H 10V1000U±20%8×16 C5	TC505,TC514
0260659	CD	CD288H 35V220U±20%10×12 5	TC503
0410010	CHOKE COIL	VERTICAL 10UH 1A 5mm	L505,L509
0410011	CHOKE COIL	VERTICAL 10UH 2A 5mm	L507,L508
0570013	DIODE	HER105	D506,D508,D511,D512
0570018	DIODE	HER303 SHAPED R 17.5×8mm	D510
0570077	DIODE	SF34 DO-27 SHAPED R 17.5×8	D513
0570014	DIODE	HER107	D505
0570005	DIODE	1N4007	D501~D504
0580006	VOLTAGE REGULATOR DIODE	5.1V 1/2W	ZD501
0580032	VOLTAGE REGULATOR DIODE	10V±5% 1/2W	ZD502
0882551	IC	FSDH321 DIP	U501
0880863	IC	HA17431VP TO-92	U503 (19)
0882041	IC	MIK431C TO-92	U503 (19)
0882462	IC	AZ431AZ-A TO-92	U503 (19)
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L503
1080011	PHOTOELECTRIC COUPLER	HS817	U502 (20)
1080006	PHOTOELECTRIC COUPLER	PC817	U502 (20)
0780049	TRIODE	S8550D	Q501
1000022	POWER GRID FILTER	JLB1153 33uH +∞-0%	L501
0460560	SWITCH POWERTRANSFORMER	@BCK-25-0091 CQC	T501

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1940077	SOCKET	11P 2.0mm	CN502
1940045	SOCKET	2P 8.0mm 2#	BCN501
1940005	SOCKET	6P 2.0mm	CN501
2300039	FUSE	@T1.6AL 250V VDE	F501 (21)
2300049	FUSE	@T1.6AL 250V 3.6×10 VDE	F502 (21)
3870115	GROUND CHIP OF POWER BOARD	AB903	G501,G502,G503,G505
1564298	PCB	@5DV717-0 UL	
DV717SI(RU) SILVER [1389C]			
REMOTE CONEROLLER 5471656			
0310048	SMD CAPACITOR	50V 151 ±5% NPO 0603	C802,C803
0630009	EMISSION PIPE	TSAL4400	LED801
0700007	SMD DIODE	1N4148	D801~D803 (22)
0700001	SMD DIODE	LS4148	D801~D803 (22)
0700002	SMD DIODE	LL4148	D801~D803 (22)
0780130	SMD TRIODE	STC3265	Q801
0880220	IC	PT2222 SOP	U801 (23)
0882379	IC	S0102B SOP	U801 (23)
0970003	CERAMIC RESONATOR	455E	X801
4000038	SELF-TAPPING SCREW	PB 2.3×6 COLOR ZINC	FOR CONNECTING UPPER COVER AND LOWER COVER
0090272	SMD RESISTOR	1/16W 1O±5% 0603	R801
1564219	PCB	8516SI-2	
3031789	REMOTE CONEROLLERSURFACE CASING	RC026-01R BLACK	
3041399	BOTTOMCASING OF REMOTE CONTROL	RC026 BLACK 2#	
3051319	BATTERYCASE DOOR OF REMOTE CONTROL	RC026 BLACK 2#	
3051273	GLASS OF REMOTE CONTROLLER	RC026 MING PURPLE	
3850124	ANODE SPRING	RC026	
3850125	CATHODE SPRING	RC026	
3850126	ANODE/CATHODE SPRING	RC026	
4631016	CONDUCT GLUE OF REMOTE CONTROL	RC026-01R 3#	
5070070	GLUE BAG	85×250	
DV717SI(RU) SILVER [1389C]			

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
SUBSIDIARY PANE PCB SEMI-FINISHED PRODUCT 5445111			
1563444	PCB	9973-2	
2121417	FLAT CABLE	4P 230 2.0 2 PIN, WITH L NEEDLE,TOGETHER DIRECTION	XS901
1340064	LIGHT TOUCH RESTORE SWITCH	KFC-A06-2WB L3.8	K901
0200307	POLYPROPYLENECAPACITOR	50V 101±10% SHAPED 5mm	C901,C902
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	JP901~JP902
0620076	RADIATION DIODE	3B3HC COLORLESS WITH BLUE	LED901
3028526	LED BRACKET（LEFT）	DV973	FASTNESS LED901
DV717SI(RU) SILVER [1389C]			
PROGRAM FLASH ROMDV717SIRU-0A(16M) 0911627			
0881650	IC	29LV160BE-70PFTN TSOP	U214 （24）
0881651	IC	M29W160EB 70N6 TSOP	U214 （24）

DV721SI Service Manual

This machine is mainly composed of decode board, power board, AV output board, MIC board and main panel.

Decode board: includes decode, servo, audio and video output circuit. Working principle is the same with that of DV717SI.

Power board: provides working voltage for each circuit and output voltage has ±9V +5V +3.3V SA+5V, etc.

AV output board: includes SCART, component video, optical and coaxial output terminal, videi output terminal, S-Video. Working principle is the same with that of DV717SI.

MIC board: with dual-channel microphone input function, and headphone amplifying circuit deletion.

Main panel: button function control, remote control and LCD display.

Remark: in order to better know the composition of machine for readers, we have made PCB composition figure, the connecting lines in PCB composition figure are the main control liner, signal line and power cord connected through flat cable, but all connected flat cable are not included.

7.1.1 Features

◆Compatible with DivX, MPEG4 discs to produce wonderful pictures.

◆ 108MHz/12bit video DAC, with more vivid and brilliant pictures.

◆ Digital echo Karaoke to enable your singing easier.

◆ Composite Video, S-Video and Component Video outputs.

◆ Bullt-In Dolby Digital decoder, separate 5.1Ch Outputs.

◆ Dolby output for 2channel(DOWNMIX).

◆ DVD-Audio decoding output to reproduce original and realistic sound effects.

◆ Brightness, chroma and contrast adjustment functions to render your eyes more comfortable.

◆ DTS, Dolby Digital, PCM Digital audio outputs to satisfy the Fans'Ss acoustic requirements.

◆ Optical and coaxial outputs for Digital audio.

◆ Progressive-scan video outputs to eliminate the flickers hardly ouvercome by interlacing scan and therefore your eyesight will be well-protected. At the same time, the pictures deflnltion Is sharply enhanced and the pictures will be finer, smoother and stabler

7.2.1 PCB board block diagram of the player

PCB board block diagram of the player is shown in the following figure 7.2.1.1:

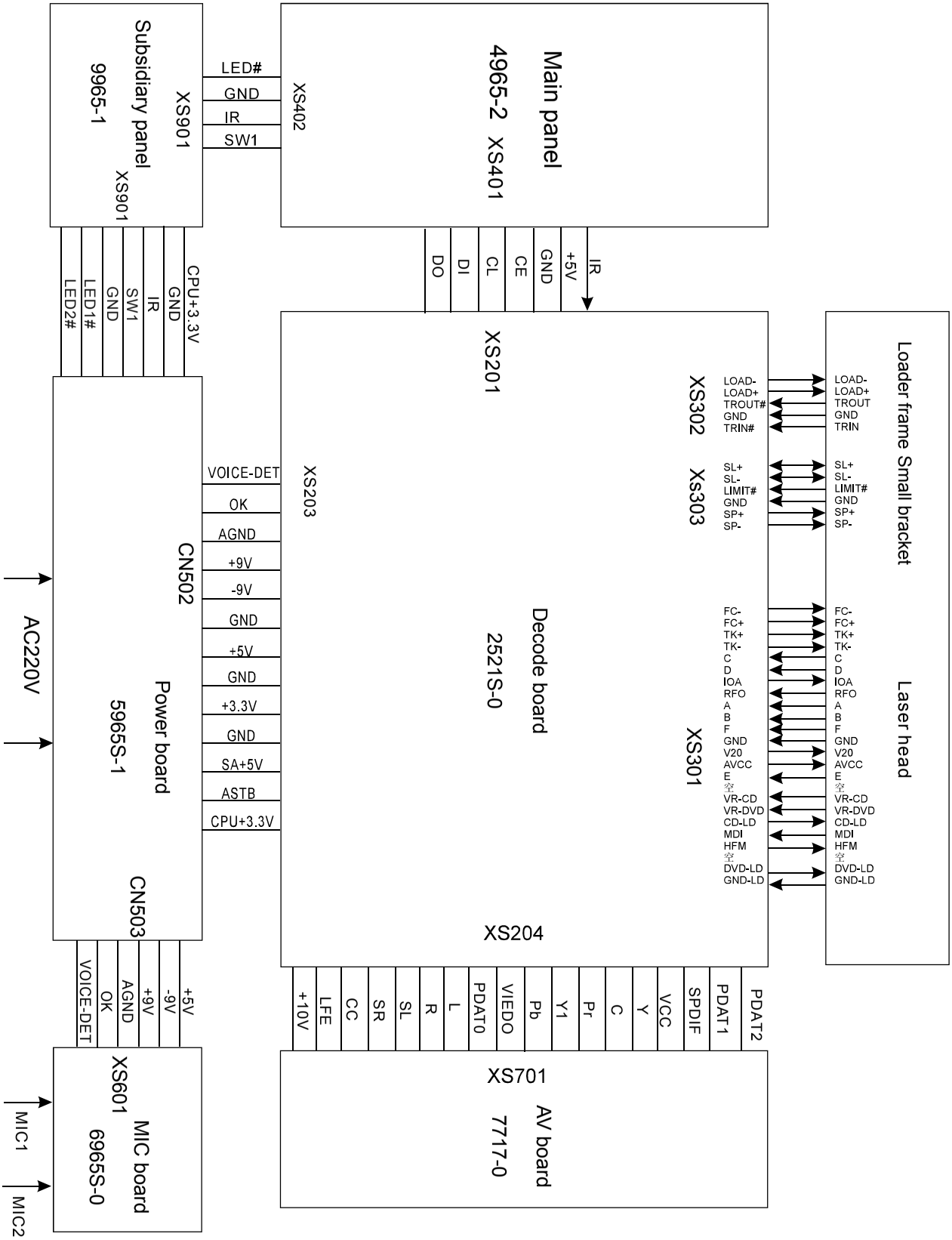


Figure 7.2.1.1 PCB board block diagram of the player

As for decode board working principle of this player, it only cancels headphone signal loop on the basis of DV717SI, AV board working principle is the same with that of DV717SI, only PCB board is different. We will mainly introduce differences, and now we will introduce MIC board, main panel and power board working principle of DV721SI.

7.3.1 MIC circuit

1. MIC circuit block diagram is shown in the figure 7.3.1.1:

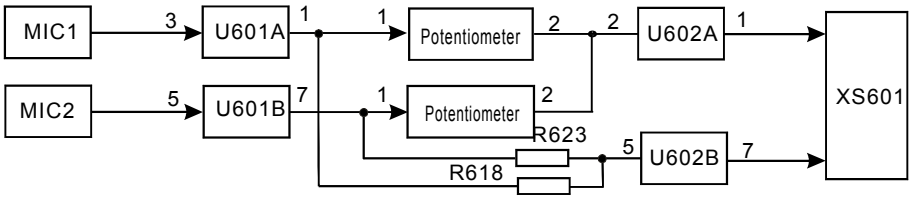


Figure 7.3.1.1 MIC circuit block diagram

2. Working principle: this machine includes two-way MIC input, which adopts 9P MIC holder with quieting function and dual-channel volume adjustment function. After inserting microphone and begin to sing, signals inputted by MIC are inputted to pin 3, 5 of U601 respectively for amplifying and then output from pin 1, 7 of U601 and then twp paths are divided. One path, after volume adjustment through potentiometer, inputs from pin 2 of U602 for mixed amplifying and outputs from pin 1 through flat cable holder XS601 to power board and decode board. The other path, enters the comparator composed by U602B through R623/R618, when input signal is up to a certain range, DET pin has high level output, mute circuit controlled by decode chip does not mute; when input signal is not enough, DET is level. VD601 VD602 in circuit are protection diode and VD603 is rectification diode.

7.3.2 Control panel circuit

1. Control panel block diagram is shown in the figure 7.3.2.1:

2. Working principle: after power on, power board only has 3.3V voltage output, pin 2 of power board standby IC U505 outputs high level and lightens standby light in red, other circuits do not work. After power on, each voltage output is normal, pin 6 of U505 outputs high level, and high level of pin 2 turns off at the same time, standby light turns off, and power board begins to supply power for each circuit.

Decode system begins to start up, main panel U402 obtains power supply and outputs high level in P2/S2 end, +5V power, through U404 voltage regulating, outputs 3.5V power from pin 2 to supply power for LED402 LED403 of background light board through V402 to make background light on, at the same time, Sw1 outputs high level Ks1, OSC circuit begins to work, and panel button module enters ready state. If K12 is low level, buttons have no function.

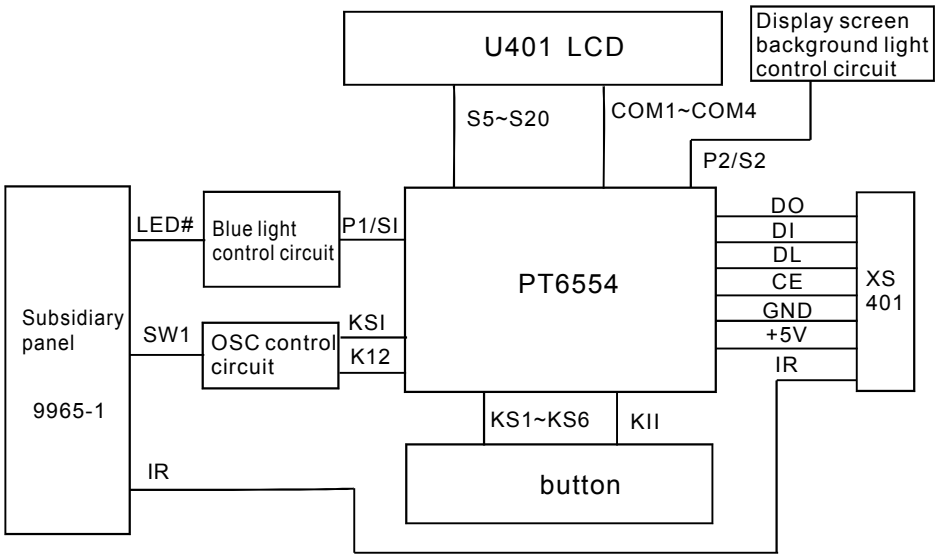


Figure 7.3.2.1 Control panel circuit block diagram

At the same time, P1/S1 outputs high level to make the blue background light of mirror on and background light may be turned on and off through firmware. Decode chip gives out display data to Pt6554 to make it drive LCD to display.

Remote control principle: remote control receiver lies in subsidiary panel, which is supplied power by CPU3.3V, remote control signal IR is divided into two ways: one path arrives at decode board through main panel to realize operation functions; the other way realizes remote control power on through power board standby control circuit.

7.3.3 Power circuit

1. Power circuit block diagram is shown in the figure 7.3.3.1:

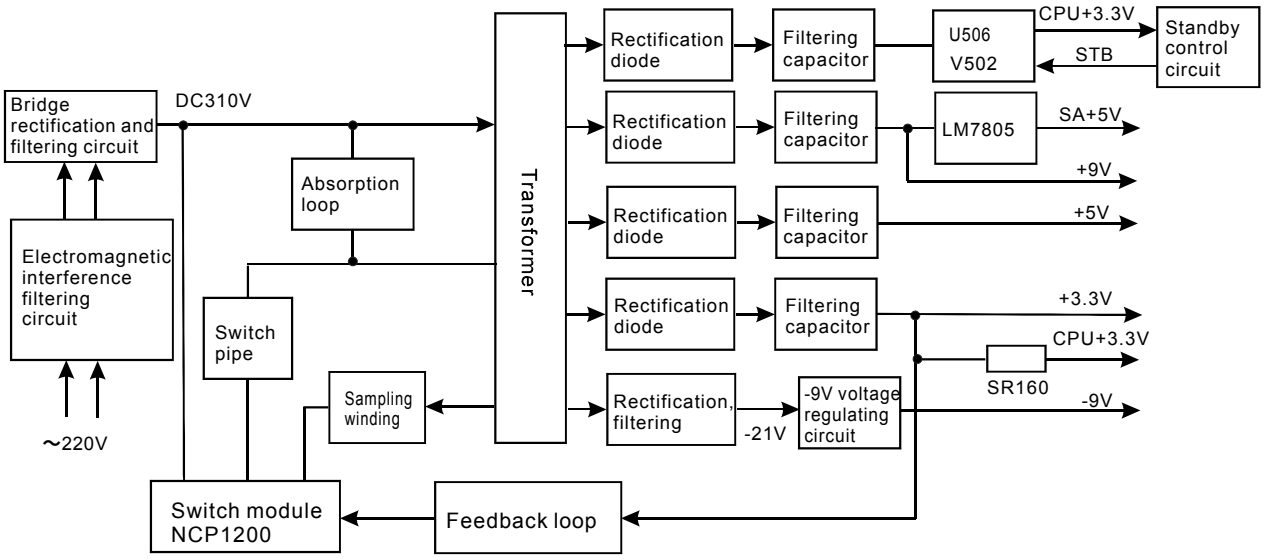


Figure 3.2.12.2 Power circuit block diagram

2. Circuit principle: through power socket, protector tube, voltage dependent resistor R501, common mode rejection BC501 and L501, 220V AC is added to the bridge rectification circuit composed by D501-D504. Diode adopts good performance In4007 which has higher voltage resist value than In4001. 310V DC that outputs after bridge rectification, through TC517, C502, C503 filtering, is added to 2-4 winding of transformer YR501 and sent to pin 5 of switch module after rectification. The switch module start voltage is not sent by D506, R505, but taken from 311V of pin 8 and achieved after being processed inside IC. R503, C502, D505 and C503 compose absorption loop to provide discharge loop of reverse electromotive force for transformer 2-4 winding. Transformer 6-7 winding, through D506 half wave rectification, TC502 and R502 filtering, provides about 10V power for pin 6 of NCP1200. Pin 2 of NCP1200 is feedback control pin, which controls the on state of internal field effect tube to make output voltage stable. Pin 4 of NCP1200 is connected to ground, pin 8 HV is connected to high voltage line, pin 5 DRV drives output of external MOSFET, which belongs to current control type, drain electrode max limit current 110mA and working frequency is 40kHz, 60kHz.

3. Five branch circuits are divided for those coupled to secondary level through transformer

(1) Voltage outputted by secondary level 16 pin, through D513 half rectification, controllable silicon, TC515 and filtering, outputs CPU3.3V to supply power for CPU;

(2) Voltage outputted by pin 15 of transformer, through D508 half wave rectification, TC503, L505 and TC504∏-type filtering, +9V is achieved, then SA+5V through LM7805 voltage regulating, which supplies power for decode board.

(3) After half wave rectification, ∏-type filtering, pin 12 voltage of transformer outputs 3.3V to supply power for decode board through D515;

(4) After D511 half wave rectification, ZD502 voltage regulating, pin 9 voltage of transformer outputs -9V to supply power for audio circuit.

We should mention that voltage outputted from secondary level of transformer is pulse DC, so stable DC level may be achieved only through half wave rectification. Diode of half wave rectification adopts quick recovery diode, which works in high frequency state, so we cannot substitute with common diode.

Feedback sampling of switch power is from 3.3V (DC power off is from CPU3.3V, power on is from +3.3V) and supplies for photoelectric coupler 2501 through D516 and R506, and sends to R pin of 2.5V comparator through R508 and R509. When 3.3V is on high side, KA pin of comparator LM431A is on, and then sent to pin 4 of switch IC268P through 2501 photoelectric coupling to decrease the on time of inside switch to decrease the coupling of transformer and the outputted 3.3V to reach the purpose of auto control. Vice verse.

This machine has DC power on/off function, so switch power has been designed a power management part with main elements U403 12C508A. It is a programmable logic controller responsible for DC power on/off and LED indicator light control. This p-layer is also with this function, no matter

When the machine is on or in standby, high voltage [art of power board, 3.3V output, sampling and feedback circuit are all in working state.

4. DC power on/off working principle is shown in the figure 7.3.3.2:

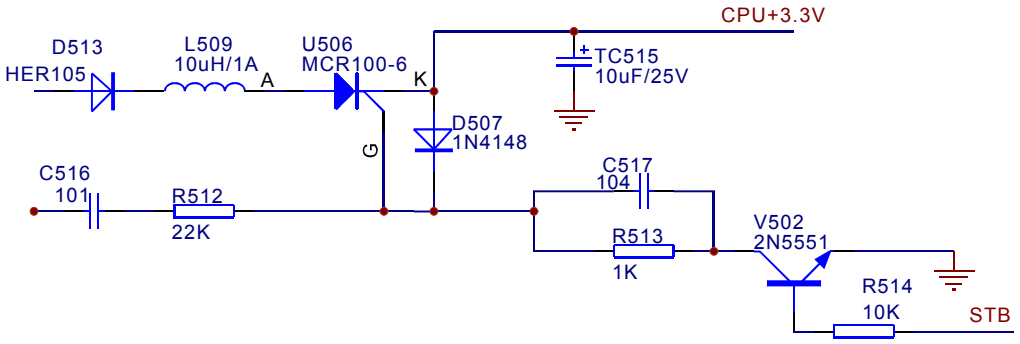


Figure 7.3.3.2 DC power on/off diagram

5. Standby working principle: shown in the figure 7.3.3.3, when working normally, after pressing STANDBY button (or remote controller STANDBY button), SW1 produces a low level, pin 2 of U505 receives the pulse of low level, and outputs a low level signal from pin 5 to make triode V502 cut off; when Tc515 anode is more than 3.3V, it feedback to U503 and make U501 decrease “On” time through U502 and make voltage stabilize in 3.3V, for the winding group of pin 16 of TR501 is most, voltage is highest, when TC515 anode is increasing to 3.3V voltage, other winding voltage is very low, and machine cannot enter working state to realize standby.

Standby function of remote control is similar to panel button.

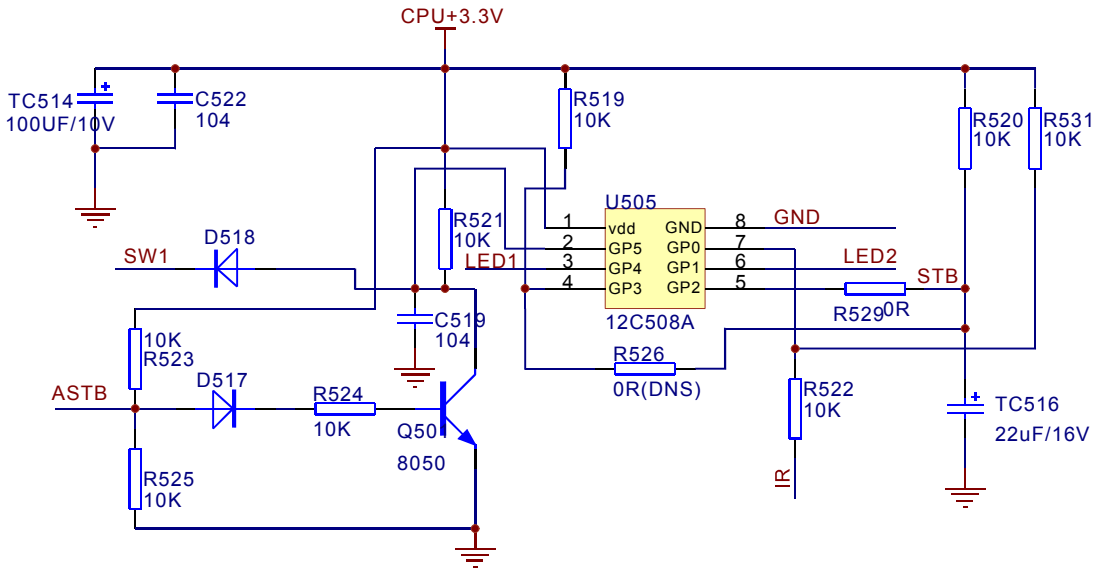


Figure 7.3.3.3 Standby, power on circuit diagram

6. Working principle of power on: shown in the figure 7.3.3.3, Sw1 is equal to the input end of D-type trigger inside U505, each time when Sw1 inputs a triggering level to pin 2 of U505, trigger turns over once, that is pin 3, 5 turn over once. When the player is in standby state, pin 3 LED is defaulted high level to drive panel indicator on; pin 5 STB is defaulted low level, that is V502 base electrode low level.

When pressing POWER button on panel (or remote controller), SW1 inputs trigerring low level (or IR inputs power-on signal) to P2 9P7) of U403, pin 3 of U505 changes to low level, panel standby indicator light turns out; at the same time, pin 5 outputs high level to send to base electrode of V502 to make it on, collector electrode changes to low level to make pulse signal of pin 3 of U506 short circuit to ground, controllable silicon cuts off, pin 2 has no output, now CPU+3.3V is provided by +3.3V winding, voltage at this time is low, so voltage increase quickly through feedback loop secondary level winding, and outputs voltage to supply power for each part through rectification, filtering or voltage regulating.

7.4.1 Troubleshooting flow chart

1. Troubleshooting process for “CPU3.3V has no voltage output” is shown in the figure 7.4.1.1:

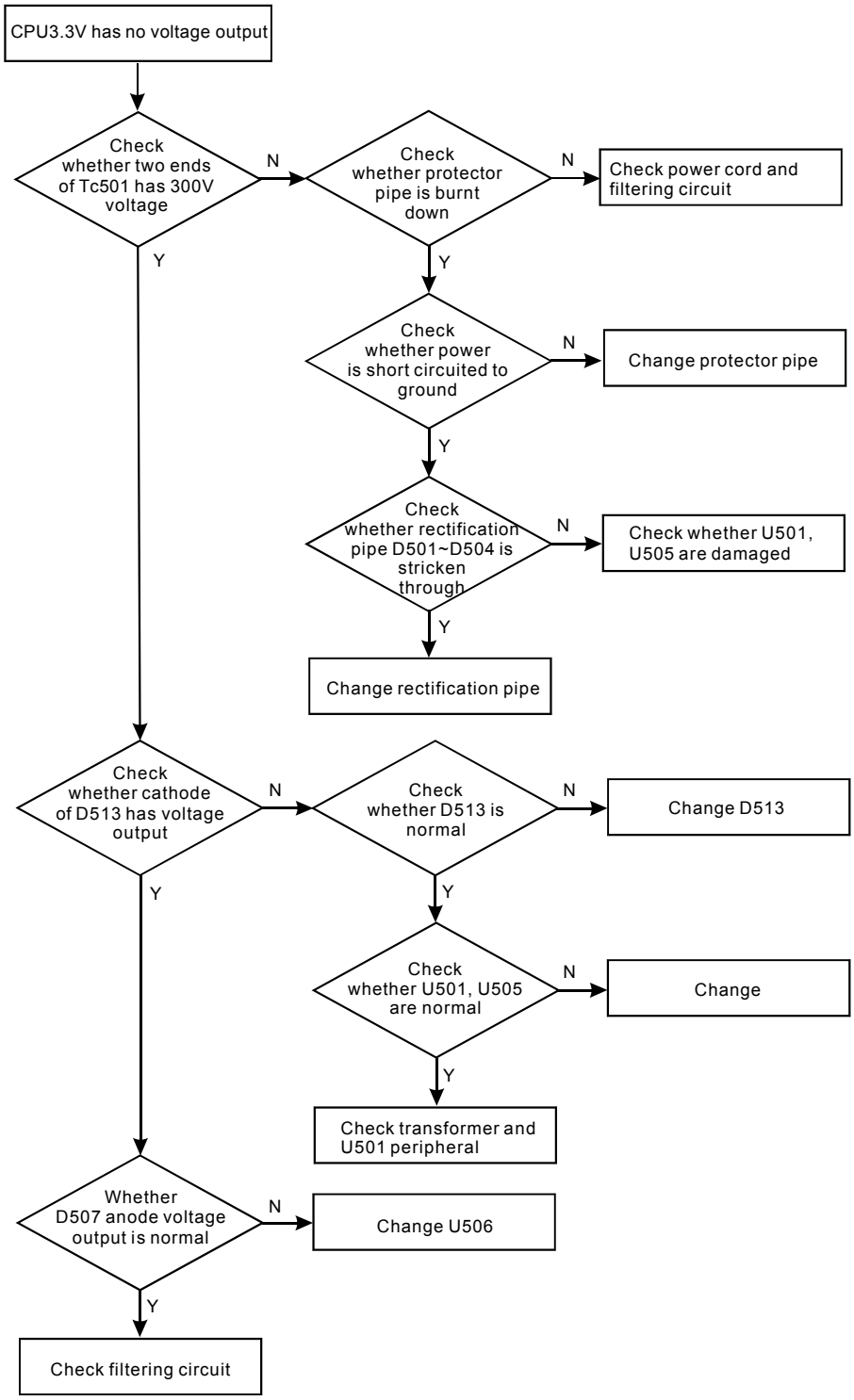


Figure 7.4.1.1 Troubleshooting flow chart for “CPU3.3V has no voltage output”

2. Troubleshooting process for “No +5V voltage” is shown in the following figure 7.4.1.2:

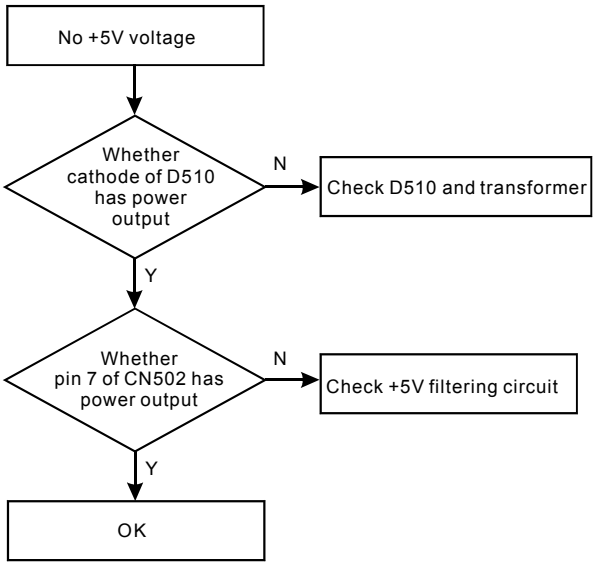


Figure 7.4.1.2 Troubleshooting flow chart for “No +5V voltage”

3. Troubleshooting process for “Voltage output is unstable” is shown in the following figure 7.4.1.3:

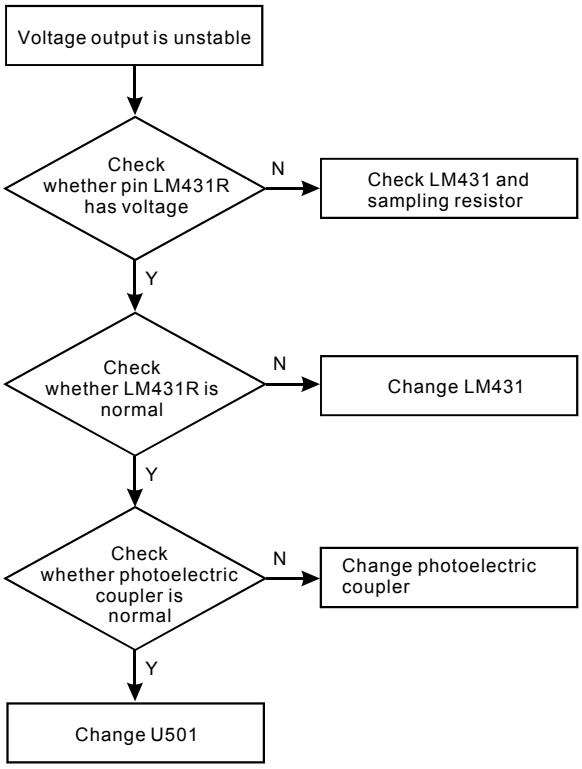
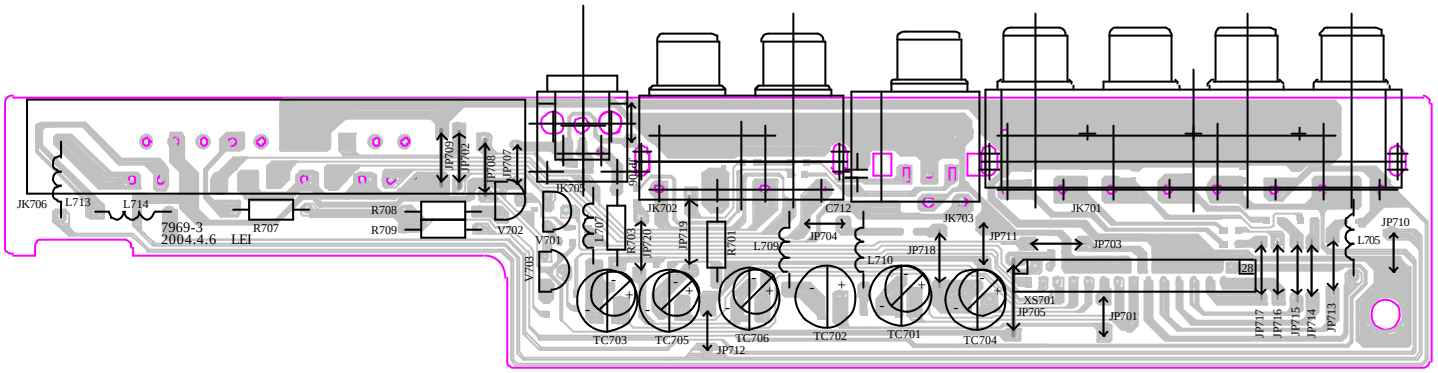


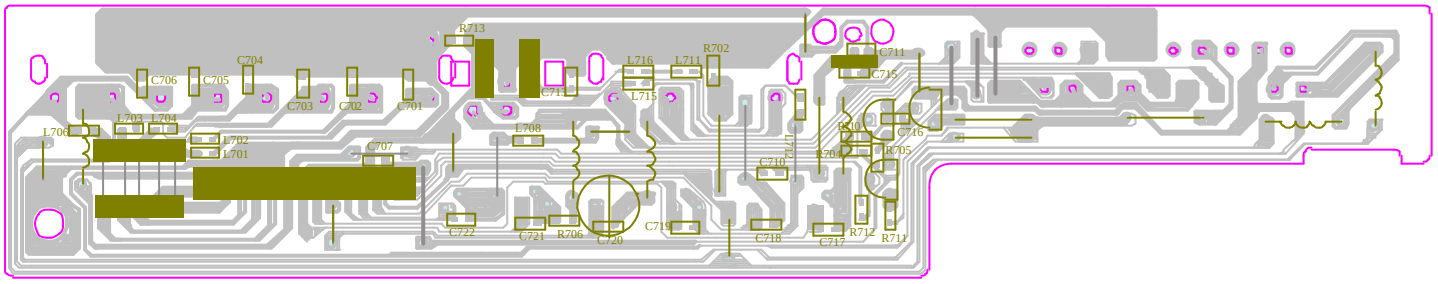
Figure 7.4.1.3 Troubleshooting flow chart for “Voltage output is unstable”

7.5.1 PCB board

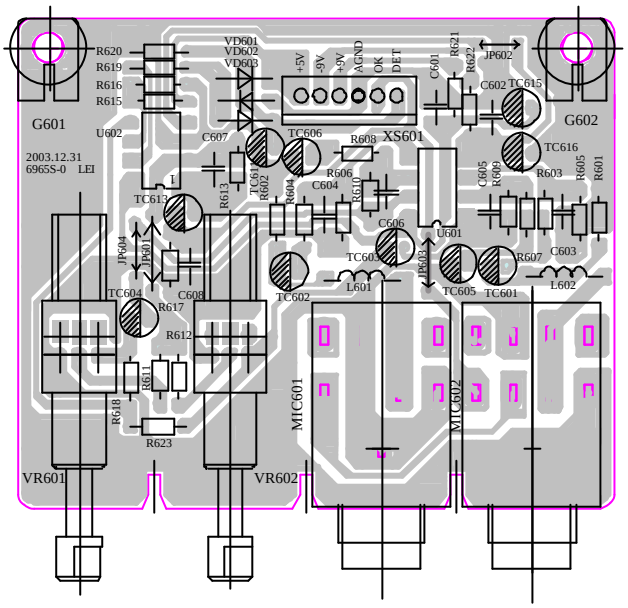
1. Surface layer of AV OUT Board



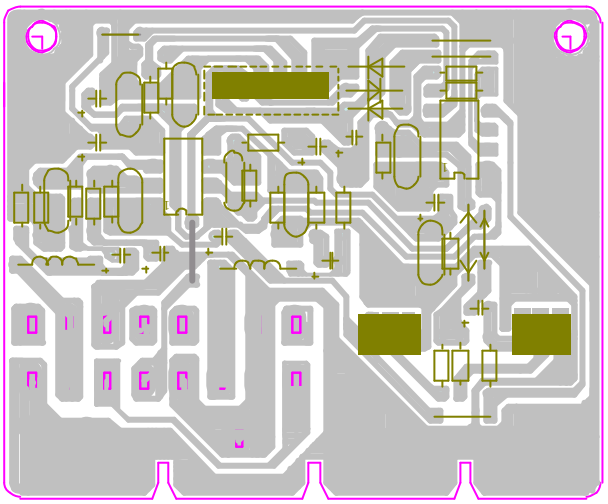
2. Bottom layer of AV OUT Board



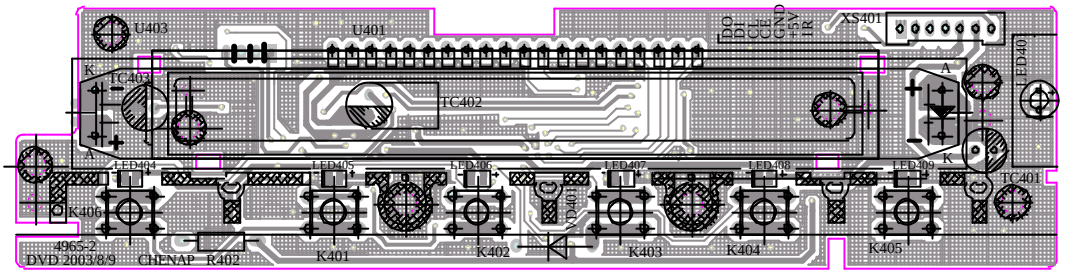
3. Surface layer of MIC Board



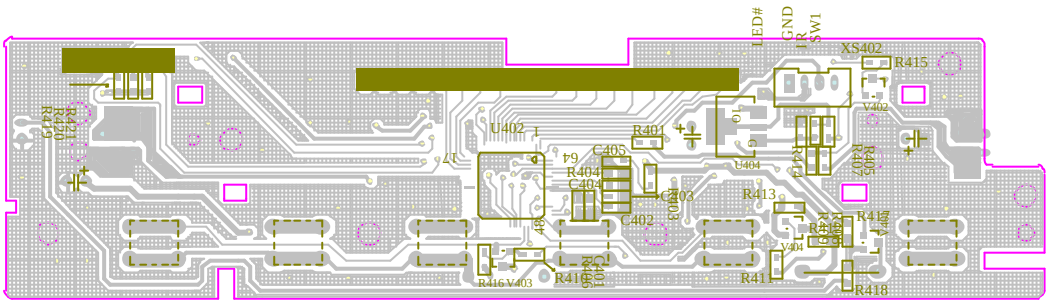
4. Bottom layer of MIC Board



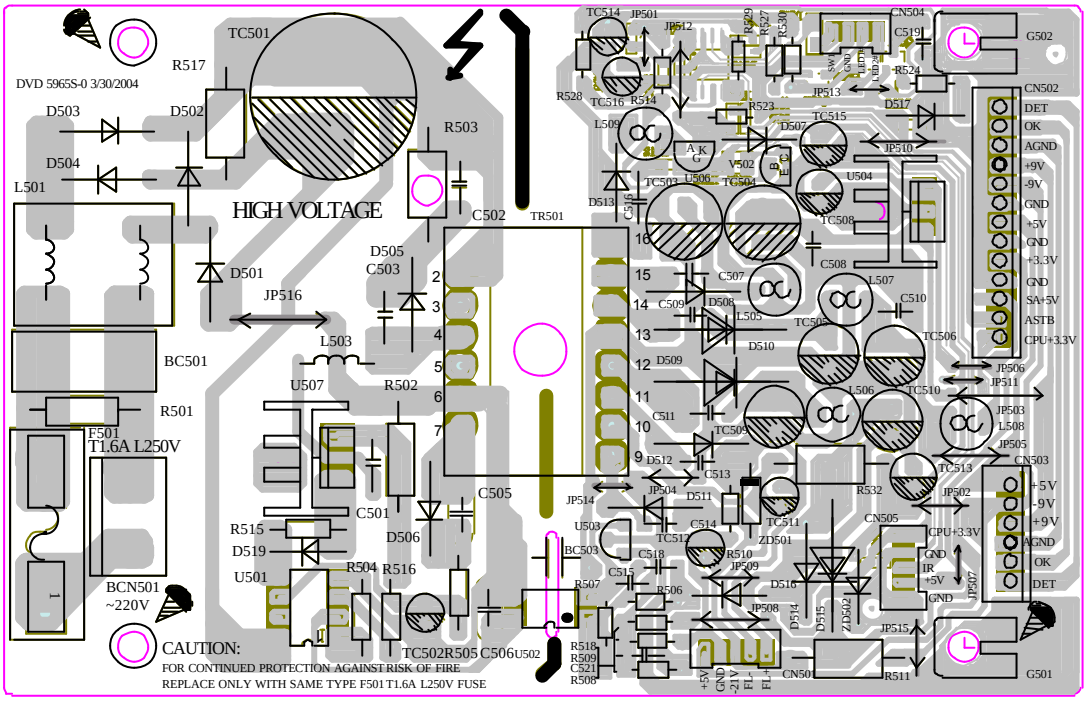
5. Surface layer of KEY SCAN Board



6. Bottom layer of KEY SCAN Board

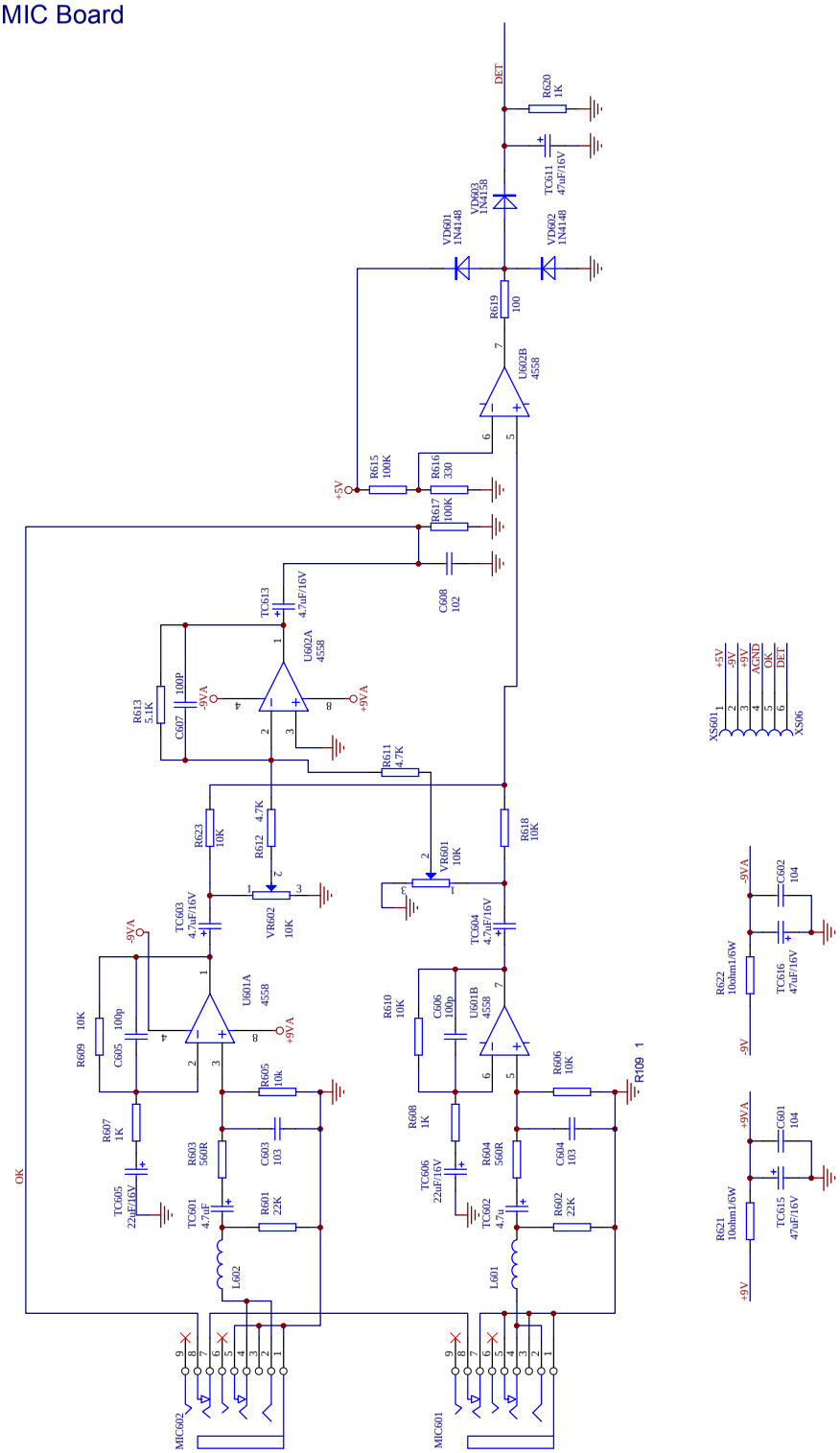


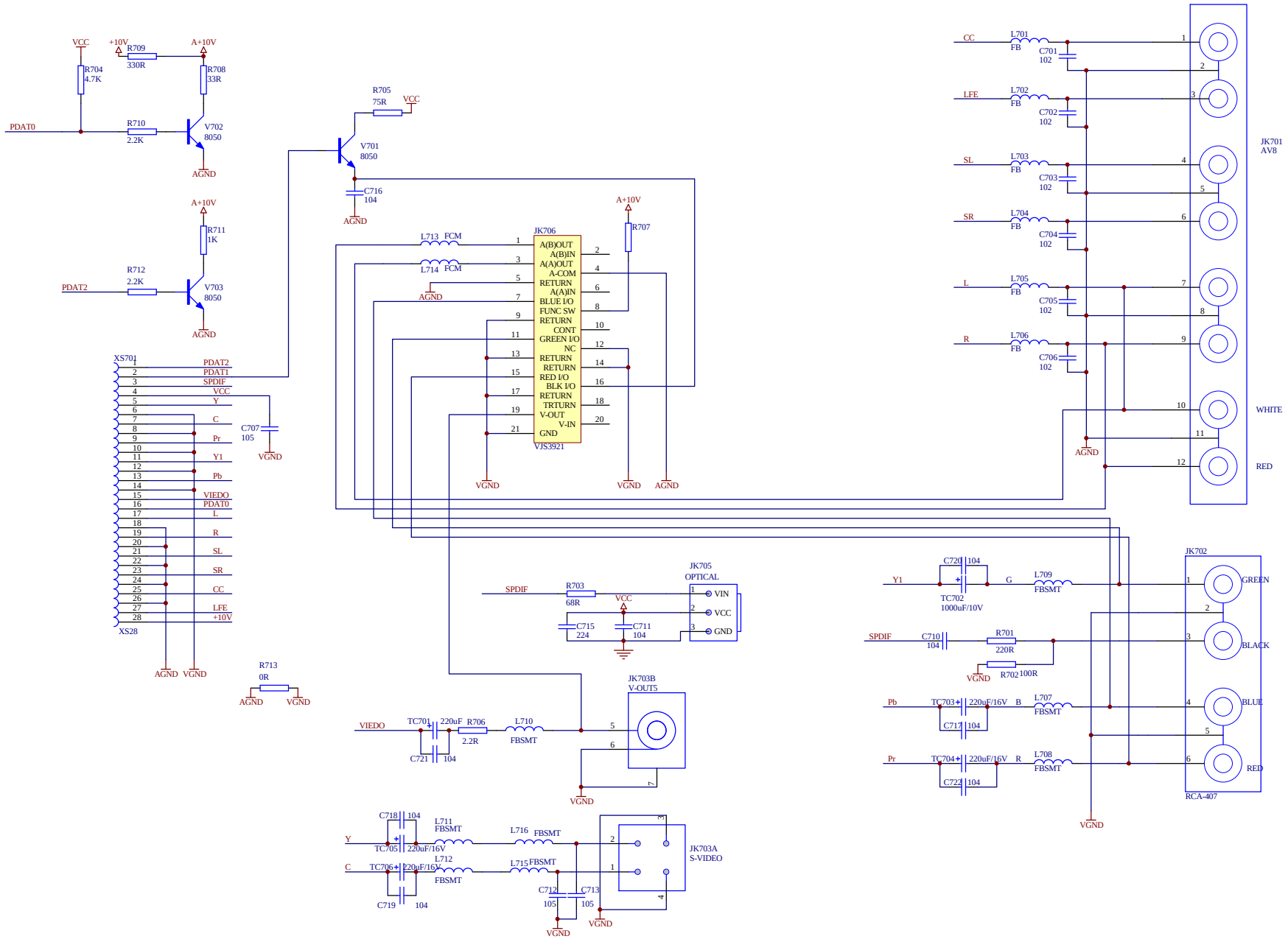
7. POWER Board

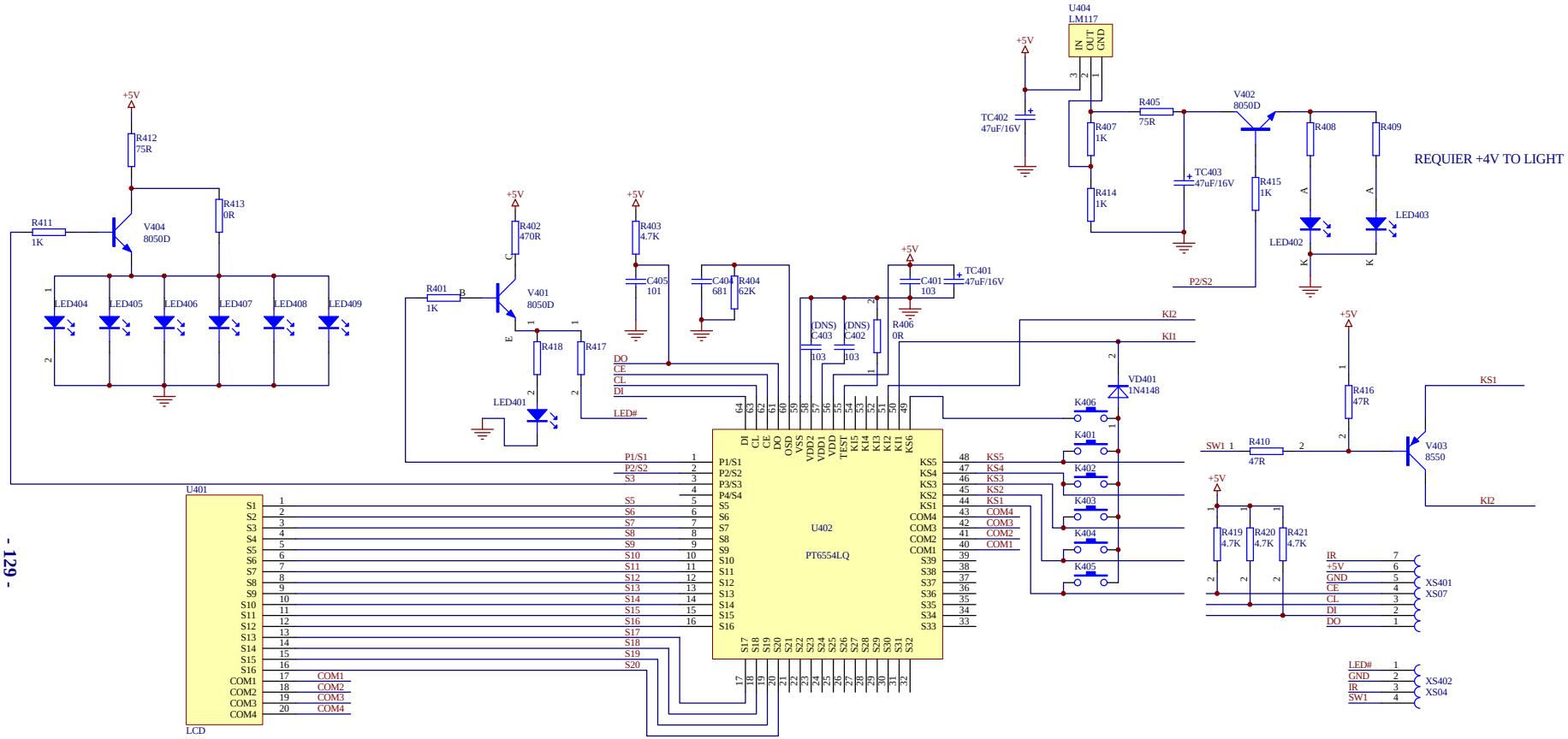


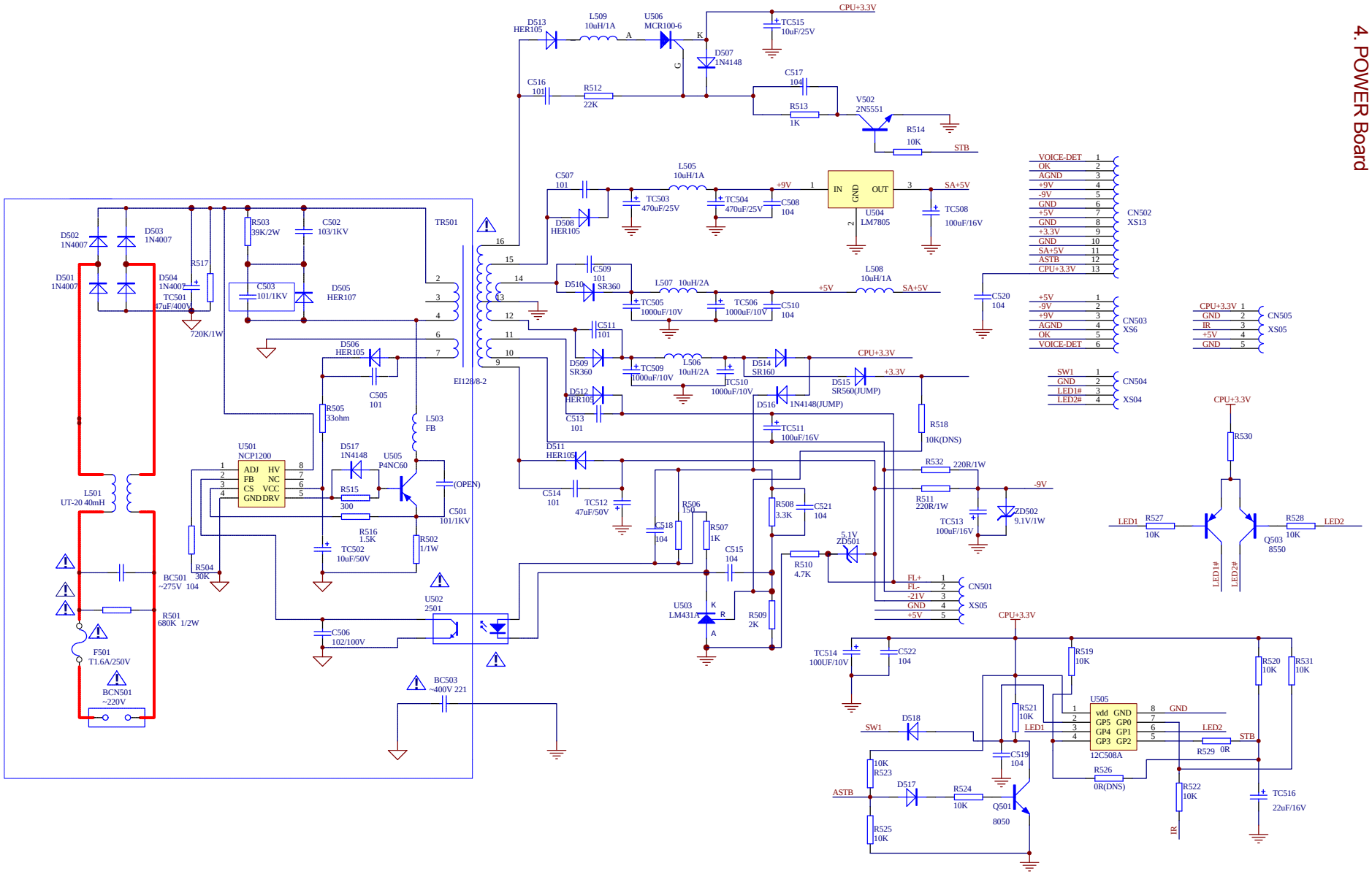
7.5.2 circuit diagram

1. MIC Board




VCC
+10V
A+10V
R709
330R
R704
4.7K
R708
33R
PDAT0
R710
2.2K
V702
8050
AGND
A+10V
R711
1K
R712
2.2K
PDAT2
V703
8050
AGND
R705
75R
VCC
V701
8050
C716
104
AGND
XS701
PDAT2
PDAT1
SPDIF
VCC
Y
C
Pr
Y1
Pb
VIEDO
PDAT0
L
R
SL
SR
CC
LFE
+10V
XS28
C707
105
VGND
AGND
VGND
R713
0R
AGND
VGND
JK706
A(B)OUT
A(B)IN
A(A)OUT
A-COM
RETURN
A(A)IN
BLUE I/O
FUNC SW
RETURN
CONT
GREEN I/O
NC
RETURN
RETURN
RED I/O
BLK I/O
RETURN
TRTURN
V-OUT
V-IN
GND
VJS3921
L713 FCM
L714 FCM
AGND
A+10V
R707
VGND
VGND
AGND
CC
L701
FB
C701
102
LFE
L702
FB
C702
102
SL
L703
FB
C703
102
SR
L704
FB
C704
102
L
L705
FB
C705
102
R
L706
FB
C706
102
AGND
JK701
AV8
WHITE
RED
SPDIF
R703
68R
VCC
C715
224
C711
104
JK705
OPTICAL
VIN
VCC
GND
VIEDO
TC701
220uF
R706
2.2R
C721
104
L710
FBSMT
JK703B
V-OUT5
VGND
C718
104
Y
TC705
220uF/16V
L711
FBSMT
L716
FBSMT
C
TC706
220uF/16V
L712
FBSMT
C719
104
L715
FBSMT
C712
105
C713
105
VGND
VGND
JK703A
S-VIDEO
Y1
C720
104
TC702
1000uF/10V
G
L709
FBSMT
JK702
GREEN
SPDIF
C710
104
R701
220R
R702
100R
VGND
BLACK
Pb
TC703
220uF/16V
B
L707
FBSMT
C717
104
BLUE
Pr
TC704
220uF/16V
R
L708
FBSMT
C722
104
RED
RCA-407
VGND


REQUIER +4V TO LIGHT
U404
LM117
IN
OUT
GND
TC402
47uF/16V
R405
75R
V402
8050D
R407
1K
R414
1K
TC403
47uF/16V
R415
1K
R408
R409
LED402
LED403
P2/S2
R412
75R
R411
1K
R413
0R
V404
8050D
LED404
LED405
LED406
LED407
LED408
LED409
R402
470R
R401
1K
V401
8050D
R418
R417
LED401
R403
4.7K
C405
101
C404
681
R404
62K
TC401
47uF/16V
C401
103
(DNS)
C403
103
(DNS)
C402
103
R406
0R
DO
CE
CL
DI
LED#
KI2
KI1
VD401
1N4148
K406
K401
K402
K403
K404
K405
R416
47R
KS1
SW1
R410
47R
V403
8550
KI2
R419
4.7K
R420
4.7K
R421
4.7K
IR
+5V
GND
CE
CL
DI
DO
XS401
XS07
LED#
GND
IR
SW1
XS402
XS04
U401
LCD
COM1
COM2
COM3
COM4
U402
PT6554LQ
P1/S1
P2/S2
P3/S3
P4/S4
KS5
KS4
KS3
KS2
KS1
COM4
COM3
COM2
COM1


CPU+3.3V
D513 HER105
L509 10uH/1A
U506 MCR100-6
TC515 10uF/25V
D507 1N4148
C516 101
R512 22K
C517 104
R513 1K
V502 2N5551
R514 10K
STB
C507 101
L505 10uH/1A
+9V
TC503 470uF/25V
TC504 470uF/25V
C508 104
U504 LM7805
SA+5V
TC508 100uF/16V
D508 HER105
VOICE-DET
OK
AGND
+9V
-9V
GND
+5V
GND
+3.3V
GND
SA+5V
ASTB
CPU+3.3V
CN502 XS13
C509 101
D510 SR360
L507 10uH/2A
TC505 1000uF/10V
TC506 1000uF/10V
C510 104
L508 10uH/1A
C520 104
+5V
-9V
+9V
AGND
OK
VOICE-DET
CN503 XS6
CPU+3.3V
GND
IR
+5V
GND
CN505 XS05
C511 101
D509 SR360
TC509 1000uF/10V
L506 10uH/2A
TC510 1000uF/10V
D514 SR160
D515 SR560(JUMP)
D512 HER105
D516 1N4148(JUMP)
C513 101
TC511 100uF/16V
R518 10K(DNS)
SW1
GND
LED1#
LED2#
CN504 XS04
CPU+3.3V
R530
LED1
R527 10K
R528 10K
LED2
Q503 8550
LED1#
LED2#
D511 HER105
C514 101
TC512 47uF/50V
R532 220R/1W
R511 220R/1W
TC513 100uF/16V
ZD502 9.1V/1W
-9V
R506 150
C518 104
R507 1K
R508 3.3K
C521 104
C515 104
5.1V ZD501
R510 4.7K
U503 LM431A
R509 2K
FL+
FL-
-21V
GND
+5V
CN501 XS05
CPU+3.3V
TC514 100UF/10V
C522 104
R519 10K
R520 10K
R531 10K
U505
vdd GND
GP5 GP0
GP4 GP1
GP3 GP2
12C508A
GND
LED2
STB
R529 0R
R521 10K
LED1
SW1
D518
C519 104
10K R523
ASTB
D517
R524 10K
Q501 8050
R525 10K
R526 0R(DNS)
R522 10K
IR
TC516 22uF/16V
TR501
EI28/8-2
D502 1N4007
D503 1N4007
D501 1N4007
D504 1N4007
R517
TC501 47uF/400V
720K/1W
R503 39K/2W
C502 103/1KV
C503 101/1KV
D505 HER107
D506 HER105
C505 101
R505 33ohm
L503 FB
U501 NCP1200
ADJ HV
FB NC
CS VCC
GND DRV
D517 1N4148
U505 P4NC60
R515 300
R516 1.5K
TC502 10uF/50V
R502 1/1W
C501 101/1KV
(OPEN)
R504 30K
BC501 ~275V 104
R501 680K 1/2W
F501 T1.6A/250V
BCN501 ~220V
U502 2501
C506 102/100V
BC503 ~400V 221
L501 UT-20 40mH